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Hypochondriasis : examining aspects of a cognitive-behavioural model

Citation for published version (APA):

Haenen, M-A. (1998). *Hypochondriasis : examining aspects of a cognitive-behavioural model*. [Doctoral Thesis, Maastricht University]. Universiteit Maastricht. https://doi.org/10.26481/dis.19980917mh

Document status and date:
Published: 01/01/1998

DOI:
10.26481/dis.19980917mh

Document Version:
Publisher's PDF, also known as Version of record

Please check the document version of this publication:

• A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
• The final author version and the galley proof are versions of the publication after peer review.
• The final published version features the final layout of the paper including the volume, issue and page numbers.

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Download date: 06 May. 2023

Hypochondriasis

Examining aspects of a cognitive-behavioural model

Ontwerp omslag
Josee Driessen

Druk
Datawyse Maastricht

ISBN nummer 90-9011932-9

Hypochondriasis
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Proefschrift

ter verkrijging van de graad van doctor
aan de Universiteit Maastricht,
op gezag van de Rector Magnificus,
Prof. Dr. A.C. Nieuwenhuijzen Kruseman,
volgens het besluit van het College van Decanen,
in het openbaar te verdedigen op
donderdag 17 september 1998 om 16.00 uur

door

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Aan mijn ouders

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Chapter 1

Introduction

1.1 Clinical picture

Mrs. Chambers is a 54-year-old secretary, married and mother of four children. She frequently visits her general practitioner because she is preoccupied about getting cancer. Whenever she hears about the disease, be it during a meeting with friends or acquaintances or while watching a medical information program on television, she is terrified. She hardly sleeps at night and she constantly checks her body, looking for signs that might indicate that there is something wrong. Her husband and children keep telling her to stop worrying, but Mrs. Chambers is unable to do so. Nowadays, the oldest son leaves the room as soon as his mother starts complaining about her health status. The doctor has done the necessary examinations more than once, but even though he concluded that Mrs. Chambers is as fit as a fiddle, she can hardly believe him. She is afraid her doctor might have overlooked something. Therefore she repeatedly asks him to send her to the clinic for a more thorough medical check up. In the past, these demands were conceded. Immediately afterwards Mrs. Chambers felt reassured, as her extreme health fears seemed to have disappeared. Unfortunately, the next day she was as anxious and troubled as before. In order to stop Mrs. Chambers from what he considers to be senseless 'doctor-shopping', the physician no longer grants her requests.

1.2 History of hypochondriasis

Although the concept of hypochondriasis has existed for at least two millennia, its meaning has changed with the passage of time, describing various syndromes. Throughout the ages it has been given much attention, not only in nosological contributions, but also in literature and arts. Great doctors and philosophers tried every drug and therapeutic regime at their command to control this common misery which they believed resulted from a mixture of physiological imbalance and social frustration. In his overview on hypochondriasis, Kenyon (1965) outlined eighteen different meanings of the term that have been used since its first use, varying from 'madness', 'malingering', 'defense mechanism', 'schizophrenia' or 'personality trait', to 'preoccupation with bodily or mental health'. The opposite also happened: the disorder that is now known as hypochondriasis has been given many different appellations throughout the ages, describing it as a kind of melancholy, bad temper or arrogance, or as the English Malady, referring to it as a typically English complaint.

The cause of hypochondriasis has long been a matter of controversy. Four hundred years before Christ, Hippocrates was the first to use the word hypochondrium. It referred then to the anatomic site hypo (under) the chondros (the cartilage of the ribs), including the liver and gall bladder, the spleen and the stomach. Apart from organs situated beneath the cartilage, hypochondriacal complaints were attributed to the spleen, bowels, animal spirits, and others.

Whereas during the second century A.D. the term hypochondriasis expressed a broader range of digestive disorders, during the Middle Ages interest in hypochondriasis waned, as attention was focussed on salvation and eternal life more than on the flesh. In those days the word hypochondriasis was used to describe a condition characterized by morbid doubt as to the adequacy of one's devotion and a terrible fear not of disease and death but of eternal damnation. It was during the Renaissance, when people

strongly believed that only the melancholic were capable of inspiration and creativity, that hypochondriasis emerged again. In that period, it was considered far more fashionable to be moody, extremely sensitive and somewhat ill, than it was to be insensitively healthy. This attitude was evident in poems and plays as well as in the habits of well-known persons.

During the eighteenth century both hysteria and hypochondriasis were reclassified as weaknesses of the nervous system. In their historical reviews of the term hypochondriasis, Kenyon (1965) and Baur (1988) mention the French clinician Jean-Pierre Falret who, in 1822, was the first to associate hypochondriasis with false beliefs in an impaired physical health. From that time on, the disorder was more and more considered to be primarily a mental disease with associated physical problems. While for years hypochondriasis had been regarded as the male equivalent of hysteria, the typically female illness, by the end of the nineteenth century this distinction had disappeared and either sex was able to have either complaint. With hysteria classified as a purely mental illness and hypochondriasis as either mental confusion or physical illness, however, hypochondriasis nearly dropped out of sight.

By the beginning of the twentieth century, the psychoanalytic view on hypochondriasis was profoundly influenced by Freud's views. According to Freud (1914), all organs of the human body were latent erotogenic zones that, to a varying degree, were able to act as substitutes for genitals. He believed that the symptoms of hypochondriasis reflected actual changes in the patient's organs that were the direct somatic consequences of sexual disturbances. As hypochondriacal symptoms were thought not to contain any hidden explanations of past problems, Freud considered them to be unanalyzable, resistant to medical treatment, and of little interest to psychoanalysts.

In the middle of the present century, it even became part of the medical policy not to take notice of the disorder and its sufferers. Almost no hypochondriasis research was undertaken, no papers written, and the term itself was dropped from national and international registers of recognized disorders. Hypochondriasis though continued to exist, gradually re-attracting medical attention.

Nowadays hypochondriasis refers to a preoccupation with the possibility (or reality) of being ill, with concerns for health overshadowing daily thoughts and activities far beyond reason. A diversity of diseases and body regions can be the focus of hypochondriacal fears and worries. According to Kenyon (1976), the head and neck region, followed by the abdomen, and then the chest are the most common locations of symptoms.

1.3 Diagnostic aspects

In the most recent version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, 1994) hypochondriasis is classified as one of the somatoform disorders, which are characterized by the presence of physical signs or symptoms that are not under voluntary control. Although these sensations cannot be fully explained by a general medical condition, by the direct effects of a substance, or by another mental disorder, they cause clinically significant distress or impairment in social, occupational, or other areas of functioning.

In revising the former DSM-III criteria (APA, 1980), DSM-III-R (APA, 1987) included

a criterion that required a duration of six months to exclude transient reactions. Subsequently, the currently used DSM-IV diagnostic criteria for Hypochondriasis added criteria D and F listed below, and a specification of the degree of insight.

Diagnostic criteria for 300.7 Hypochondriasis

A. Preoccupation with fears of having, or the idea that one has, a serious disease based on the person's misinterpretation of bodily symptoms.

B. The preoccupation persists despite appropriate medical evaluation and reassurance.

C. The belief in Criterion A is not of delusional intensity (as in Delusional Disorder, Somatic Type) and is not restricted to a circumscribed concern about appearance (as in Body Dysmorphic Disorder).

D. The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

E. The duration of the disturbance is at least 6 months.

F. The preoccupation is not better accounted for by Generalized Anxiety Disorder, Obsessive-Compulsive Disorder, Panic Disorder, a Major Depressive Episode, Separation Anxiety, or another Somatoform Disorder.

Specify if: *With poor insight*
If, for most of the time during the current episode, the person does not recognize that the concern about having a serious illness is excessive or unreasonable.

According to DSM-IV, the preoccupation in hypochondriasis may be with bodily functions, with minor physical abnormalities or with vague and ambiguous physical sensations. The hypochondriacal person attributes these symptoms or signs to the suspected disease and is very concerned about their meaning, authenticity and etiology. The concerns may involve several body systems, at different times or simultaneously. Alternatively, there may be preoccupation with a specific organ or a single disease, for example, with the fear of having cardiac disease.

Barsky, Wyshak and Klerman (1986) refer to the rather vague nosological status of hypochondriasis. Hypochondriacal attitudes, beliefs, and behaviours may form an entity, a diagnosable psychiatric disorder, which is either present or absent. However, according to the authors, these may best be thought of as an intensification of a normal concern with personal health and disease, that is present in varying degrees in different individuals.

Schmidt (1994) lists several problems stemming from the term hypochondriasis as defined by DSM-IV criteria, mentioning again that DSM-IV does not acknowledge the continual character of hypochondriasis. Moreover, Schmidt challenges the view that health anxiety and disease conviction are of equal diagnostic importance. Instead, in line with Warwick and Salkovskis (1989), he claims that health anxiety can occur without disease conviction but the opposite is impossible, making health anxiety a primary feature of hypochondriasis. Salkovskis and Clark (1993) point

out the compelling similarity between illness phobia and simple or specific phobia. The necessity of medical reassurance is another difficult issue in their opinion, as some patients with plain hypochondriasis either do not have access to medical reassurance or do all they can to avoid medical consultation. Besides, the fact that 'appropriate medical evaluation and reassurance' (see criterion B) is too much dependent upon subjective quality judgment is another point of criticism. What is more, it is considered somewhat odd to define the patient's illness in terms of the doctor's behaviour.

In some cases it can be difficult to distinguish hypochondriasis from another psychopathological disorder. With regard to hypochondriasis and panic disorder, Salkovskis and Clark (1993) stress how these disorders differentiate when interpretation of acute anxiety responses are concerned. Whereas panic patients expect a feared catastrophe to occur at a short notice, causing them to present with acute behavioural actions (escape and avoidance), hypochondriacal patients' focus is on a broader range of catastrophes, expected to happen on a long-term basis, leading not only to escape and avoidance but also to checking behaviours and reassurance seeking. Generalized anxiety disorder is also easily misdiagnosed as hypochondriasis. Patients with generalized anxiety disorder, however, are usually concerned about several life domains and they demonstrate reassurance-seeking behaviour to a far lesser extent than hypochondriacal patients (Vandereycken et al., 1996).

In recent years clinicians as well as researchers in the field of hypochondriasis have argued that hypochondriasis or a subtype of it should be grouped in the Anxiety Disorder section of the DSM-IV (Starcevic, 1990; Barsky, 1992a; Barsky, 1992b; Salkovskis & Clark, 1993; Schmidt, 1994). Others conceive of hypochondriasis as a personality characteristic and advocate the introduction of the hypochondriacal personality disorder, a condition associated with traits of perfectionism and rigidity and in classification closest to anankastic personality disorder, within the DSM-IV personality domain (Tyrer, Fowler-Dixon & Ferguson, 1990). Alternatively, some believe that hypochondriacal complaints and behaviours are mainly secondary to another disorder (e.g. a masked depression) and therefore do not exist as a diagnostic entity. The latter option will be discussed further in the next section.

1.3.1 Primary and secondary hypochondriasis

When discussing hypochondriasis, often a distinction is made between 'primary' and 'secondary' hypochondriasis. There seems to be little agreement, however, on what is meant by these adjectives. Some authors use them to indicate the sequence in which problems developed (Warwick & Salkovskis, 1990), e.g. the patient suffered from hypochondriasis first, and later on he also developed an affective disorder. Studying medical outpatients with hypochondriasis in a one-year follow-up, Noyes, Kathol, Fisher, Phillips, Suelzer and Woodman (1994a) found that most of the hypochondriacal subjects who had coexisting anxiety and depressive disorders on initial presentation to the medical clinic continued to meet criteria for these disorders at follow-up. In most instances, hypochondriasis preceded the onset of depression, leading the authors to conclude that

hypochondriasis was probably the primary illness. On the other hand, hypochondriasis might be secondary in some anxious patients as coexisting anxiety often came first. Other authors consider the primary/secondary distinction to indicate a degree of importance; for example, the patient suffered mainly from hypochondriasis and, to a lesser degree, he also felt depressed. Also, the word primary may refer to a diagnostic entity as opposed to health anxiety symptoms that exist as part of another syndrome (Warwick, 1995; Kellner, 1992). According to Barsky, Wyshak and Klerman (1992), primary hypochondriasis should refer to a hypochondriacal style characterized by a general inclination to worry about health, focus on one's body, and amplify discomfort. Secondary hypochondriasis, on the other hand, would refer to a specific set of functional somatic symptoms, with their associated fears and beliefs, secondary to another psychiatric disorder or to a major life stress. As to the latter option, Kenyon (1964, 1976) concluded that hypochondriasis was almost always part of another syndrome, either depression, anxiety, obsessive-compulsive disorder, schizophrenia or personality disorders. Pilowsky (1967), on the contrary, regarded conviction of the presence of disease with non-response to reassurance as the only diagnosis to be an independent neurotic syndrome, which he therefore called 'primary hypochondriasis'. According to Pilowsky, 'secondary hypochondriasis' was the clinical feature including depressive and anxiety syndromes.

1.3.2 Transient hypochondriasis

According to Kirmayer (1986), transient hypochondriacal fears are often seen as part of a stress response syndrome. Barsky, Wyshak and Klerman (1990) found that patients with transient hypochondriasis were characterized by less disease fear and conviction, less bodily preoccupation and less comorbidity than DSM-III-R chronic hypochondriacal patients. Besides, they were less disabled, more satisfied with their health condition and with the medical care they received. As compared to non-hypochondriacal patients, the transient group was medically more sick, had more lifetime axis 1 disorder and higher levels of personality disorder. In a more recent longitudinal study Barsky, Cleary, Sarnie and Klerman (1993) compared 22 patients known to have had a previous episode of transient hypochondriasis and 24 non-hypochondriacal patients (not significantly differing in axis 1 diagnosis or personality disorder score). Hypochondriacal symptoms and the tendency to amplify bodily sensations at baseline evaluation appeared to be the only significant predictors of hypochondriacal symptoms in the one-year follow-up. Unfortunately, Barsky et al. simply state that groups did not differ with regard to axis I diagnoses without reporting exact diagnoses. Noyes et al. (1994a) examined the diagnostic stability and outcome of hypochondriasis in 50 medical outpatients and 50 controls from the same clinic. Their data provided evidence for the predictive validity of DSM-III-R hypochondriasis, as the diagnosis of hypochondriasis was stable over time and, although symptoms waxed and waned, characteristic features persisted.

1.3.3 Illness phobia

When studying hypochondriasis, it can be noticed that the nomenclature used when discussing the topic is quite confusing. Besides the term hypochondriasis, "illness phobia", "nosophobia", "disease phobia", "health anxiety" are also frequently used. To some these terms are interchangeable, whereas others consider them to describe different phenomena.

Warwick and Salkovskis (1989) propose a differentiation between illness phobia (i.e. the fear of a serious illness) and hypochondriasis or disease conviction (i.e. the belief in a serious illness) in terms of symptoms experienced and extent of avoidant behaviours displayed. Moreover, the authors suggest that in most patients both conditions might occur, subjects fluctuating between the two depending on their level of anxiety. For the illness phobic, external stimuli become associated with illness, whereas for the hypochondriacal patient these stimuli are mainly internal. As a result, authors regard coping in illness phobia to be characterized by avoidance of the feared stimuli; in hypochondriasis neutralization behaviours are utilized as a coping strategy. Vandereycken, Hoogduin and Emmelkamp (1996) emphasize the importance of this differentiation between conviction and fear, as different aspects of behaviour are aimed at and different therapeutic strategies are used in the treatment of either disorder. Also, it appears that treatment outcome prognosis is more positive in anxious hypochondriacs as compared to convinced hypochondriacs.

Contrary to Warwick and Salkovskis' classification, Noyes et al. (1994a) define illness phobia as a subtype of hypochondriasis. Comparing illness phobics and hypochondriacal subjects, Noyes, Wesner and Fisher (1992) concluded that the first group can be distinguished from the second in that they are concerned about specific illnesses, the majority of them being more distressed by fear and by anxious thoughts than by somatic symptoms, physical distress being relatively minor or even absent. Also, instead of believing themselves to be ill, the illness phobics rather feared the future possibility.

DSM-IV (APA, 1994), on the other hand, uses the term "disease phobia" to describe a condition in which the individual is fearful of being exposed to a disease, whereas hypochondriacal subjects are best characterized by a preoccupation that they have the disease.

Finally, Marks (1987) regards hypochondriasis as characterized by fears concerning multiple bodily symptoms. Illness phobia, on the other hand, represents a focal form of hypochondriasis in which fear is persistently focussed on a single symptom or illness.

1.4 Prevalence

Results of prevalence studies of hypochondriasis vary a great deal, depending on the diagnostic criteria used, the population studied and whether one looks for the diagnosis of hypochondriasis in clinical charts or the presence of hypochondriacal beliefs, convictions and attitudes. Examining the prevalence of the common fears and phobias in the general population, Agras, Sylvester and Oliveau (1969) found that 12 percent of the men interviewed and 20 percent of

the women admitted to being somewhat afraid of illness. Although only three percent of the population seemed intensely afraid of disease, this was the most common phobia encountered. The estimation of the proportion of patients who attend clinics and physicians' offices with somatic symptoms for which no organic cause is found have ranged from 20 to 84 percent (Kellner, 1986) and from 30 to 80 percent (Barsky & Klerman, 1983). Barsky, Barnett and Cleary (1994) estimate the prevalence of current DSM-III-R hypochondriasis in a primary care setting to range from 4.2 percent to 6.3 percent, DSM-IV mentions a prevalence rate of between 4% and 9% in general medical practice, whereas in psychiatric patients it is reported to be up to 12.5 percent (Kellner, 1986).

1.5 Predisposing and risk factors

Torgersen (1986) studied the contribution of hereditary factors in somatoform disorders in monozygotic and dizygotic index twins and their co-twins. Based on Present State Examination (PSE interview) data, a concordance of 29% in monozygotic and 10% in dizygotic pairs was found. The study showed a high frequency of anxiety disorders according to DSM-III criteria, especially generalized anxiety disorders, in the co-twins of somatoform disordered twins. This suggests a familial and perhaps genetic transmission of somatoform disorders and, on the other hand, the results point to an association between the somatoform disorder group and generalized anxiety disorder.

As to sex ratio, hypochondriasis has been reported by some to be much more common in women (Fava, Pilowsky, Pierfederici, Bernardi & Pathak, 1982), by others to be slightly preponderant in men (Mechanic, 1972), or to be equally common in males and in females (APA, 1994). Studying the prevalence of hypochondriacal beliefs and attitudes in normal subjects by means of questionnaires, Kellner (1986) reports that no significant differences were found between males and females.

Those repeatedly found more likely to develop hypochondriasis are the elderly (Brink, Janakes & Martinez, 1981) and medical students (Woods et al., 1966; Kellner, Wiggins & Pathak, 1986). According to Kellner et al. (1986), transient fears about illness are also common among other students. Moreover, the high incidence during the four years of medical study and the relatively low prevalence is considered illustrative of the disorders' short-lived character in this group (Kellner et al., 1986).

Kellner (1986) enumerates physiological and cognitive risk factors associated with developing hypochondriasis as well as factors that precipitate the development of the disorder or maintain its existence. As to physiology, a low pain threshold to experimental pain in severely hypochondriacal patients (Bond, 1971) is mentioned as well as the negative correlation between sensation threshold and pain tolerance on the one hand and disease conviction and disease phobia on the other hand. Selective perception and attitude towards symptoms also appear to play an important role in functional somatic symptoms and hypochondriasis. A personal physical illness, particularly in childhood, and past experience with disease in a family member sometimes precipitate somatic functional symptoms, especially if

good physical health and fitness are overvalued ideas or a source of self-esteem. With respect to maintaining factors, selectively perceiving and attending to bodily changes (motivated by the fear of having a disease) encourages hypochondriacal preoccupations. The same holds true for misunderstanding the nature of symptoms and overestimating their seriousness. The role of dysfunctional ideas about illness and health will be thoroughly delineated in Chapter 2, describing the cognitive-behavioural theory of hypochondriasis that plays a central role in the present thesis.

1.6 Comorbidity

Several studies have been performed focussing on the nature and extent of comorbidity among patients with hypochondriasis. Noyes et al. (1994b) found lifetime comorbidity (any psychiatric disorder) in 62% of their hypochondriacal outpatient sample and in only 30% of their matched control patients. Psychiatric illnesses such as mood disorders (Bianchi, 1973; Kellner, Slocumb & Wiggins, 1987; Noyes et al., 1994b), anxiety disorders (Bianchi, 1973; Salkovskis & Clark, 1993; Vandereycken et al., 1996), somatization disorders (Barsky et al., 1992), pain and functional somatic symptoms, personality disorders all have been demonstrated to coexist with hypochondriasis. This comorbidity may be caused by an overlap of symptom criteria, treatment-seeking bias, and by the possibility that hypochondriasis predisposes to, is associated with, or causes the comorbid disorder. Barsky, Wyshak and Klerman (1991) stress the difficulty of comorbid disorder detection in hypochondriacal patients. Authors found that primary care physicians were significantly less accurate in their diagnosis of anxiety and depressive disorders in hypochondriacal than in non-hypochondriacal patients. Barsky et al. (1991) speculate that depression, for example, may be suggested by the hypochondriacal patient's attitude.

Barsky, Wyshak and Klerman (1992) identified coexisting mood disorders in over half of hypochondriacal outpatients they studied using the Structured Clinical Interview for DSM-III-R. As for lifetime diagnosis, Barsky et al. reported that 43% of their sample had lifetime major depression, 45% had dysthymia, and 17% had panic disorder. Current major depression was diagnosed by Noyes et al. (1994b) in 28% of hypochondriasis subjects and in only 6% of control patients. Major depression often coexisted with anxiety disorders with an onset after that of hypochondriasis.

Kenyon (1964) noticed that 82% of psychiatric inpatients with secondary hypochondriasis had primary depression. Comparing depressed and non-depressed patients, Fava et al. (1982) found higher levels of hypochondriasis in the first group. Studying the presence of hypochondriacal concerns in outpatients with major depression, Demopulos, Fava, McLean, Alpert, Nierenberg and Rosenbaum (1996) found these to be more closely related to the severity of anxiety symptoms, somatic symptoms, and psychological distress than to severity of depressive symptoms. As such, hypochondriacal concerns were concluded not to be symptoms of a mood disorder but instead to be more closely associated with abnormal illness behaviour and/or specific perceptual style.

As to anxiety disorders, Kellner et al. (1987) observed that patients with DSM-III hypochondriasis had higher ratings of anxiety than matched psychiatric outpatients without hypochondriasis. Noyes et al. (1994b) state that in hypochondriacal patients current panic disorder with agoraphobia is the most frequent anxiety disorder, often beginning before or at the same time as hypochondriasis. Barsky et al. (1992) found at least one coexisting anxiety disorder in 85.7% of hypochondriacal medical outpatients, of whom the majority met criteria for generalized anxiety disorder (71.4%) and others reported agoraphobia (42.9%) and panic disorder (16.7%). Comparing the comorbidity of primary care patients with panic disorder and patients with hypochondriasis, Barsky, Barnett and Cleary (1994) found 13.3% of hypochondriacal patients to have comorbid, current panic disorder, while 25% of patients with panic disorder had comorbid, current hypochondriasis.

The prevalence of DSM-III-R somatization disorder was found to be 21% in a sample of hypochondriacal medical outpatients (Barsky et al., 1992). Oxman and Barrett (1985) reported hypochondriacal symptoms in 38% of family practice patients with somatization disorder.

As far as personality disorders are concerned, hypochondriacal subjects are stated by Noyes et al. (1994b) to have higher personality disorder and neuroticism scores than control patients. Also, more severe hypochondriasis was associated with greater axis II pathology. Barsky et al. (1992) reported that two-thirds of their hypochondriacal patients had personality disorders.

Studying outpatients with major depression, Demopulos, Fava, McLean, Alpert, Nierenberg and Rosenbaum (1996) found patients with histrionic personality disorder to have greater hypochondriacal concerns than patients without these diagnoses.

In sum, comorbidity percentages differ from study to study. This can be explained by the fact that in some studies hypochondriasis is defined as a symptom score and is assessed with self-report inventories, whereas in other studies it is defined as a disorder that meets strict diagnostic criteria and is assessed with a structured diagnostic interview.

1.7 Course and prognosis

According to DSM-IV, hypochondriasis can begin at any age, but in most cases onset seems to be in early adulthood. The disorder is usually chronic - some view this disorder as having prominent 'trait-like' characteristics - with a naturally fluctuating course, although in a minority of patients complete recovery is seen. Acute onset, general medical comorbidity, the absence of a personality disorder, and the absence of secondary gain appear to be favourable prognostic indicators (APA,1994). More severe symptoms, longer duration of illness, and coexisting psychiatric illness are predictive of a worse outcome.

In addition, Noyes et al. (1994a) found that in their one-year follow-up study of untreated medical outpatients with hypochondriasis, characteristic health attitudes, perceptions and behaviours persisted over time. More severe and chronic symptoms at the time of original assessment and a high level of neuroticism were

associated with a poor outcome. As to coexisting psychiatric illness, depression and, to a lesser extent, anxiety appeared to predict more severe hypochondriacal symptoms, a more unremitting course and impairment at follow-up.

1.8 Assessment

Emphasizing the importance of an appropriate diagnostic procedure, Warwick (1995) describes a phased assessment of hypochondriasis starting with information given by the patient (general information, cognitive factors, behavioural factors and physiological factors), followed by information from other sources (relative, case notes, other professionals involved) and measures (diaries and visual analogue ratings). As to the latter type of assessment, heightened symptom sensitivity, a morbid preoccupation with sickness and a deep-seated conviction of ill health are aspects of hypochondriacal belief systems which are reflected in responses to various tests, rating scales, inventories and questionnaires designed to elicit them. Some of these have diagnostic qualities, such as the Structured Diagnostic Interview for Hypochondriasis (Barsky, Cleary, Wyshak, Spitzer, Williams & Klerman, 1992). Others aim at assessing severity of the disorder (e.g. Maastrichtse Eigen Gezondheids-Attitude en Hypochondrie schaal; Schmidt & Lousberg, 1992) or attitudes and beliefs (e.g. Whitely Index, Pilowsky, 1967; Illness Behaviour Questionnaire, Pilowsky & Spence, 1975; Illness Attitude Scales, Kellner, 1986; Somatosensory Amplification Scale, Barsky, Wyshak & Klerman, 1990). Besides, as stressed by Kellner (1986), in the study of hypochondriasis it appears to be advantageous to measure several dimensions including anxiety, depression, and the severity of somatic symptoms in addition to hypochondriacal attitudes and beliefs, in order to evaluate the extent to which the independent variable is specifically associated with hypochondriasis as opposed to one of the associated syndromes. The diagnostic interview that was used to select hypochondriacal patients in the experimental studies in this thesis will be described in the following section.

1.8.1 The Structured Diagnostic Interview for Hypochondriasis (SDIH)

The SDIH is a clinician-administered structured diagnostic interview for diagnosing DSM-III-R hypochondriasis (SDIH), developed by Barsky, Cleary, Wyshak, Spitzer, Williams and Klerman (1992). This instrument is a module of the Structured Clinical Interview for DSM-III-R (SCID), a widely used instrument that has shown reliability comparable to that of other major diagnostic instruments (Williams, Gibbon, First, Spitzer, Davies, Borus, Howes, Kane, Pope, Rounsaville & Wittchen, 1992). The hypochondriasis module of the SCID can be employed by itself or in combination with other modules. It starts with four probe questions followed by eight questions covering the four DSM-III-R criteria for hypochondriasis. A positive answer triggers the rest of the interview. Using the responses to these questions, the interviewer judges whether or not the patient meets each of the diagnostic criteria. Negative responses to all four excludes the diagnosis of hypochondriasis. The remainder of the instrument consists of five sections, one for each of the five DSM-III-R diagnostic criteria. The interviewer

month follow-up. The fact that three of Logsdail et al.'s patients met criteria for comorbid obsessive-compulsive disorder, however, makes interpretation of therapy effect more complicated. Controlled, prospective behavioural treatment studies with follow-up are needed to confirm these promising results.

1.9.2 Cognitive-behavioural treatment

In their cognitive-behavioural approach to hypochondriasis, Salkovskis and Warwick (1986) accentuate the tendency seen in hypochondriacal patients to misinterpret bodily sensations, physical changes and medical communications (i.e. to regard them as more threatening than they really are). In addition, reassurance seeking in patients with morbid health-related preoccupations is considered to be a form of avoidance behaviour which serves to maintain the preoccupation. Salkovskis and Warwick therefore present a cognitive-behavioural treatment using response prevention to eliminate reassurance in combination with exposure to feared stimuli to facilitate cognitive change. Direct attention is given to automatic dysfunctional thoughts and misinterpretations of internal stimuli. In doing so, changes in the patient's beliefs about the nature and consequences of the problem are being pursued (Salkovskis, 1989; Warwick, 1995). Visser and Bouman (1992) used a cross-over design to evaluate a cognitive-behavioural treatment for hypochondriacal patients. The behavioural therapy, consisting of exposure in vivo and response prevention, was shown to contribute more often to approvement than cognitive treatment. In a more recent study, Visser and Bouman (1994) examined the effectiveness of 'pure' cognitive therapy (i.e. no behavioural interventions) in two hypochondriacal patients without secondary axis 1 diagnosis. After twelve treatment sessions, patients reported a decrease in the credibility of catastrophic interpretations and in level of anxiety, somatization and general distress. The authors indicate that controlled therapy effect studies are needed.

1.9.3 Cognitive-educational treatment

Based on the concept of somatosensory amplification, i.e. the tendency to experience somatic and visceral sensations as intense, noxious, and disturbing (Barsky, Goodson, Lane & Cleary, 1988; Barsky, Wyshak & Klerman, 1990), a cognitive-educational treatment has been presented (Barsky, Geringer & Wool, 1988; Barsky, 1996). In this method the physician assists the patient in coping with chronic and disabling hypochondriacal symptoms. In group sessions patients learn about the nature, perception and reporting of physical complaints. The attention paid to symptoms, the thoughts the patient has about them, the context in which symptoms are experienced and the patient's mood are seen as psychological factors that amplify somatic distress and hypochondriacal health concerns. The treatment does not aim at symptom elimination but, instead, at improved coping and reduced disability. Unfortunately, no objective outcome measures are mentioned when discussing therapy effects. Stern and Fernandez (1991) carried out this cognitive-educational group treatment in an uncontrolled study with six general hospital patients fulfilling DSM-III-R hypochondriasis criteria. The outcome reported by the authors was a significant decrease in the number of medical consultations and in the time spent thinking about illness, and

a non-significant reduction in anxiety and depression. In a controlled study with 17 hypochondriacal patients Avia, Ruiz, Olivares, Crespo, Guisado, Sánchez and Varela (1996) also examined the effectiveness of this treatment. Patients were admitted either to the experimental group or to the waiting list control group. Data were collected immediately after treatment and in the follow-up after one-and-a-half months and after one year. The treatment appeared effective as subjects in the experimental group showed significant reductions in illness fears and attitudes, somatic symptoms, and dysfunctional beliefs. The control group, on the contrary, showed some positive change in illness attitudes, but no change in somatic symptoms and even an increase in the number of medical consultations. Long-term effects were found regarding to other fears, dysphoric mood and well-being.

A final remark must be made with respect to the role of reassurance provision in psychotherapeutic treatment. Some authors consider reassurance to be a useful aspect of therapy for hypochondriasis (Pilowsky, 1984; Starcevic, 1991), at least for patients with disease conviction (Kellner, 1982, 1992). Others state that reassurance is ineffective or even antitherapeutic because it provides only a brief respite from the doubt and anxiety, which will eventually recur or, even worse, increase (Salkovskis & Warwick, 1986; Slavney, 1987). Warwick (1992) argues that, in many cases of primary hypochondriasis, reassurance is ineffective because inadequate or confusing information is given. Effective reassurance is therefore defined as an extended process of explanation, taking account of the patient's idiosyncratic fears, doubts and beliefs, avoiding repetition of information that the patient is already familiar with. According to Warwick, hypochondriacal patients will automatically stop asking for reassurance as soon as they are provided with a proper rationale for doing so, i.e. a satisfactory explanation for their symptoms is given.

1.9.4 Psychopharmacological treatment

No systematic data are available about the effect of psychopharmacological treatment of hypochondriasis. Although some advocate the use of psychotropic medication in primary hypochondriasis (Fallon, Klein & Liebowitz, 1993; Fallon, Liebowitz, Salman, Schneier, Jusino, Hollander & Klein, 1993) others are strongly opposed because of its trivial effects, the irritating side effects and the new symptoms that the patient is confronted with (Barsky, 1996). As far as treatment of secondary hypochondriasis is concerned, psychopharmacological interventions, directed largely at coexisting anxiety, depression, or obsessive compulsive disorder are generally considered useful.

Viswanathan and Paradis (1991) effectively treated a patient suffering from DSM-III-R hypochondriasis, who was certain that she had cancer, with the antidepressant fluoxetine. The patient significantly improved within two weeks after starting on a regimen of fluoxetine, and again at 14-month follow-up. Recovery was characterized by substantial decrease in the frequency, duration and intensity of thoughts of illness. In a study with 10 patients, Wesner and Noyes (1991) demonstrated that the anti-depressant imipramine was an effective drug

in the treatment of illness phobia. According to Barsky (1992b), there is a subgroup of hypochondriacal patients in whom disease fear dominates the clinical picture. As these patients might be closer to the anxiety disorders in general and to obsessive-compulsive disorder in particular, anti-obsessional medication might prove effective. In a single case study, treatment with clomipramine, an antidepressant, proved to be effective in treating hypochondriasis without obsessive-compulsive symptoms (Stone, 1993). Double blind placebo-controlled treatment outcome studies are needed, using large sample sizes in order to test it.

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judges whether each criterion is satisfied, based upon the information elicited by all of the questions in that section. The SDIH was shown by Barsky et al. (1992) to have good interrater reliability, as agreement on the DSM-III-R diagnostic criteria was 88% to 97% and agreement on the diagnosis was 96%. Validity was also proven to be satisfactory. The interview correlated significantly with the primary care physicians' ratings of hypochondriasis, demonstrating concurrent validity. Several clinical characteristics thought to be secondary features of hypochondriasis were significantly more prevalent in interview-positive patients than in interview-negative patients, which indicates good external validity. Finally, the interview appeared to have discriminant validity, because patients diagnosed as hypochondriacal had several other clinical features that distinguished them from the patients who scored above the cutoff on hypochondriacal symptomatology, but were not diagnosed as hypochondriacal with the SDIH.

1.9 Treatment

Although data on the history and course of untreated hypochondriasis are lacking, the general impression is that it is an enduring and disabling disorder. Unfortunately, no generally effective, widely accepted therapy exists. Behavioural, cognitive, educational and pharmacotherapeutic strategies are currently being applied in hypochondriasis therapy. Literature on treatment effectiveness is limited and difficult to compare as most studies are uncontrolled, inclusion criteria and comorbidity data differ, populations studied vary from medical to psychiatric inpatient or outpatient, small samples or single-case designs are used and different objective outcome measures are reported (if any). Present-day therapeutic methods will be described briefly below. Psychodynamic insight will be left aside, as it is not particularly helpful in treating hypochondriasis (Fallon, Klein & Liebowitz, 1993; Barsky, 1996).

1.9.1 Behavioural treatment

The behavioural treatment of illness phobia and hypochondriasis proposed by Warwick and Marks has proven to be effective (Warwick & Marks, 1988; Logsdail, Lovell, Warwick & Marks, 1991). It involves exposure to feared stimuli and response prevention, individually tailored to the main types of problem behaviour. This way, avoidance, reassurance-seeking and bodily checking are dealt with. In an uncontrolled trial without follow-up, Warwick and Marks (1988) treated 17 patients suffering from illness phobia and/or hypochondriasis with exposure and response prevention. Therapy proved to be effective in all but two patients, as health anxiety decreased and social functioning improved. However, the fact that ten patients were disease-convinced without having any physical signs gives rise to doubts as to the representativeness of these data for hypochondriasis in general. Logsdail et al. (1991), in an uncontrolled behavioural treatment study with seven non-depressed illness phobics who were afraid of contracting AIDS, also used exposure and response prevention. In five patients reduction in fears and avoidance and improvement in work and social functioning were seen after seven to ten treatment sessions and again in a three-

Chapter 2

A cognitive-behavioural theory of hypochondriasis

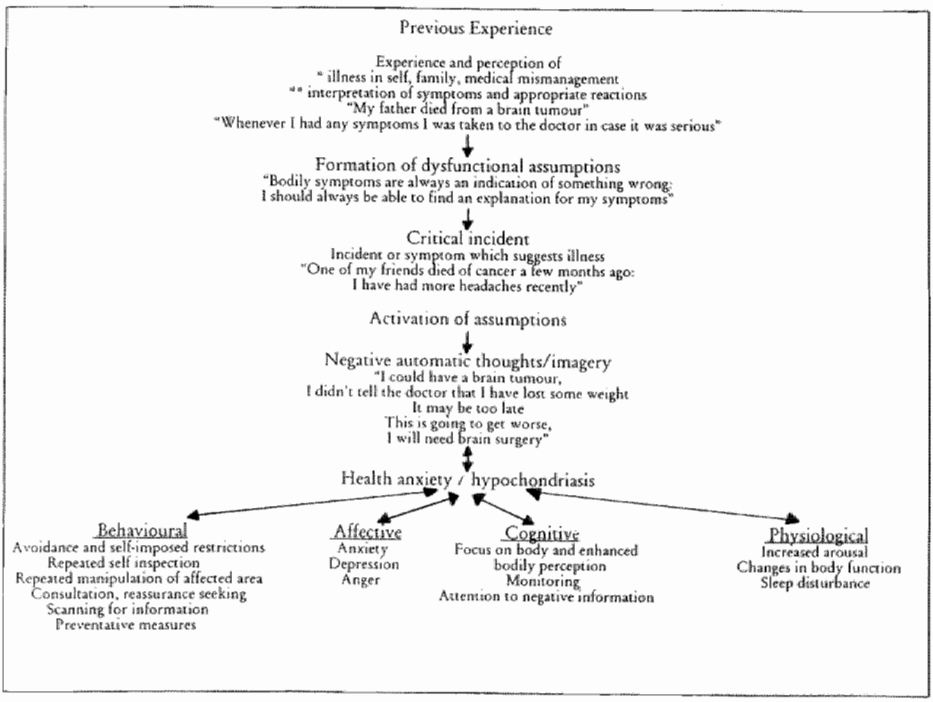
In the first chapter of this thesis several aspects of the psychopathology of hypochondriasis were briefly addressed. This second chapter describes a cognitive-behavioural model of hypochondriasis proposed by Warwick and Salkovskis, reflecting the assumed etiological and maintaining factors of the disorder.

Salkovskis and Warwick (1986) were the first to clearly put hypochondriasis in a cognitive-behavioural perspective. Addressing both etiological and maintaining factors, their cognitive-behavioural model described health anxiety and its more extreme attitudinal and behavioural manifestations in illness phobia and hypochondriasis. Without differentiating between illness phobia and disease conviction, hypochondriasis was defined as the most severe form of health anxiety, of which the preoccupation with health was the main cognitive feature (Warwick & Salkovskis, 1990). More recently, Salkovskis and Clark (1993) have proposed the modification of the diagnosis of hypochondriasis to include only the disease-convinced, i.e. to exclude illness phobics because the latter group has so much in common with patients suffering from simple or specific phobia.
The developmental and maintaining mechanisms thought to underlie hypochondriasis according to this model will be further outlined in the next sections.

2.1 Development

The development of hypochondriacal problems is schematized as follows (see Figure 1):

Figure 1. Cognitive-behavioural model of the development of hypochondriacal problems *(from Warwick & Salkovskis, 1989)*



As can been inferred from Figure 1, attitudes and dysfunctional assumptions related to illness or health are usually formed as part of early experience. Warwick and Salkovskis propose that, in severe health anxiety, innocuous physical variations and health-related communications are erroneously interpreted as indicators of physical illness (Salkovskis & Clark, 1993; Warwick, 1995; Salkovskis, 1996) and a particular illness is believed to be more probable than it really is (Salkovskis, 1989; Salkovskis & Warwick, 1986; Warwick & Salkovskis, 1989, 1990). These dysfunctional assumptions are activated by critical incidents such as perceiving symptoms or bodily changes, or reading an article about cancer. This then elicits negative automatic thoughts resulting from the occurrence (or the noticing) and misinterpretation of bodily symptoms and signs as being indicators of serious illness. The hypochondriacal disorder thus developed has various physiological, cognitive, behavioural and affective characteristics. As to the physiological consequences, anxiety is attended with actual changes in bodily function. It also leads to increased vigilance, as a result of which, in turn, further bodily sensations may be noticed. Cognitions in hypochondriasis are typified by a preoccupation with health concerns and a frequent focussing for bodily symptoms. Once a critical incident has resulted in the misinterpretation of bodily symptoms and signs as being indicators of serious illness, particular problematic assumptions lead to a so-called confirmatory bias in the patient's thinking (Salkovskis, 1989; Salkovskis & Warwick, 1986). This means that information is consistently interpreted and recalled in a way that confirms health concerns, attended to whenever it is consistent with having an illness, and ignored or reduced should it provide evidence indicating good health. Besides, the hypochondriacal person underestimates his or her potential in preventing the health threat and affecting its course. These cognitive processes help to maintain and even intensify the disorder, as the person with hypochondriasis feels more and more convinced about having a serious disease (Warwick, 1995). As far as behavioural consequences are concerned, extensive bodily checking, avoidance, and reassurance-seeking frequently occur. The latter not only involves the patient's relatives and friends, but also doctors and other professionals, such as reflexologists, acupuncturists, and hypnotists. This results in a medical consumption pattern which makes great demands upon healthcare time and resources. Abnormal illness related behaviours, too, serve to maintain the problem.

When discussing the type of feared sensations and the consequences of misinterpreting, Salkovskis and Clark (1993) state that catastrophic interpretations can lead to one of two patterns of anxiety. If the sensations or signs are not those which increase as a result of anxiety (as a consequence of autonomic arousal), or the patient does not regard the feared catastrophe as immediate, then the occurrence of hypochondriacal anxiety is the most likely. Hypochondriacal patients generally fear symptoms that are thought to indicate a less imminent, insidious health disaster (e.g. multiple sclerosis), leaving the patient enough time to seek safety by attempts to obtain medical reassurance. However, if the symptoms which are misinterpreted are those which occur as part of anxiety-induced autonomic arousal and the interpretation is that the symptoms are the signs of immediate catastrophe, a panic attack is the more likely response.

Avoidance and escape are then considered the best coping strategy. In panic patients misinterpretation is limited to sensations that rapidly intensify when anxious, such as autonomic symptoms and anxiety-related mental sensations. In hypochondriasis, both anxiety-related and anxiety-unrelated symptoms may play a part in the patient's concerns.

Before addressing the disorder's maintaining factors, one aspect of the developmental model described above needs to be dealt with. This concerns the second step in the schema, where an arrow depicts the transition from previous experiences to the formation of dysfunctional assumptions. From the schema, it appears to be a logical, inevitable step going from the one to the other. However, the opposite seems to be the case, as most individuals in society (some of whom have had the previous experiences illustrated) do not develop dysfunctional assumptions. In other words, an important link appears to be missing, namely one indicating why some people form dysfunctional assumptions about health and illness, whereas most do not. Warwick and Salkovskis' model is silent about the nature of these processes. Personality characteristics might play a crucial role in the development of the disorder, as might, for example, traumatic childhood experiences, educational style and affectivity. Such additional information is needed in order to clarify this issue, thereby improving the model considerably.

2.2 Maintenance

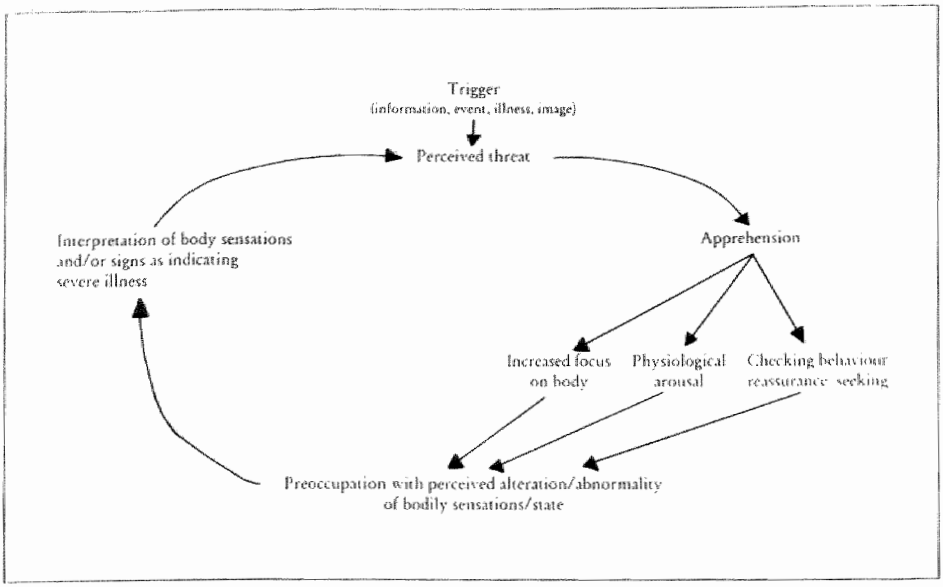
Within the cognitive-behavioural model of hypochondriasis, a low threshold for perceiving and reporting bodily sensations, symptom misinterpretation, frequent medical consultation, reassurance seeking and checking bodily state, are regarded as the maintaining characteristics (Salkovskis, 1989). More specifically, reassurance seeking is presented as an attempt to avoid a potential health disaster, causing immediate, but no more than temporary, anxiety reduction. Mood disturbance and physiological arousal are considered less prominent in maintaining the disorder.

In Figure 2 (below) the mechanisms sustaining preoccupation with health and exacerbating hypochondriacal symptoms can be schematically presented. As can been seen in Figure 2, the cognitive-behavioural approach describes three main mechanisms, physiological, cognitive and behavioural, that operate to further increase anxiety, preoccupation and misinterpretation, leading to maintenance of the patient's condition (Warwick & Salkovskis, 1990).

Physiological responses can trigger illness-related thoughts, which in turn may lead to scanning or searching for further symptoms. Consequently, physiological arousal increases as a result of health threat perception based on benign changes, most commonly noticed in the head, the neck, the abdomen and the chest (Barsky & Klerman, 1983). These autonomically-mediated sensations are often interpreted by the patient as further evidence of a physical disease (Salkovskis & Clark, 1993).

As to cognition, it appears that normal variations in bodily function or previously unnoticed aspects of appearance or bodily function come to the hypochondriacal patient's attention and are perceived as novel. Consequently, these changes can be misinterpreted as signifying pathological conditions. Also, focus of attention may induce actual changes in physiological systems.

Figure 2. Cognitive-behavioural model of the maintenance of hypochondriasis *(from Salkovskis, 1989)*



The behavioural mechanism is different for illness phobics and disease-convinced. In illness phobia, anxiety has become associated with external stimuli associated with illness, such as seeing a doctor. As a coping strategy these patients use avoidance of the feared stimuli and prevention of exposure to specific cues that generate thoughts of serious illness. On the other hand, in those suffering disease conviction - classified by Warwick and Salkovskis (1989) as 'hypochondriacal' - anxiety is triggered mainly by internal stimuli that are often elicited or attended to as a result of external cues. Neutralizing the danger is the coping style prominent in this subgroup of patients. Both avoidance and neutralizing aim at halting exposure, but, in doing so, they serve instead to maintain the patient's condition by preventing reappraisal of threat and stimulating preoccupation. The same applies to reassurance seeking by checking on bodily appearance, reading medical textbooks or discussing symptoms, which is regarded as a type of avoidance designed to terminate exposure to the feared stimuli, i.e. to neutralize hypochondriacal ideas. Reassurance is considered inappropriate and dangerous if it includes clinically unnecessary investigations and repetition of information the patient already knows. Such a strategy probably worsens the patient's condition by causing short-term anxiety reduction, but increasing longer-term anxiety and preoccupation, as well as the urge to seek further reassurance from doctors, relatives, literature or bodily checking. Therapeutic strategies within the cognitive-

behavioural model therefore aim at identifying what the actual problem is, instead of ruling out every possible physical cause. In addition, positive effects are expected from demonstrating to the patient in what way current behaviour serves to maintain symptoms and anxiety. Finally, encouragement and guidance in searching for more accurate symptom interpretation are believed to further improve the patient's condition.

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Chapter 3

Outline of this thesis

The cognitive-behavioural model of hypochondriasis described in the previous chapter is one of the few attempts to map out the disorder's different aspects, as well as the way these are connected. A schematic framework like the one proposed by Warwick and Salkovskis not only gave us the opportunity to systematically study separate aspects of hypochondriasis, it also enabled us to formulate clear, testable hypotheses based on the model. The objective of this dissertation was to critically examine the tenability of several empirical implications of the model. In doing so, six studies were performed, dealing mainly with cognitive aspects of the model. All of these studies compare the performance of patients meeting screening criteria for hypochondriasis, with that achieved by matched healthy controls.

The research questions of this thesis, the aspects of the model on which they were based, as well as the model's predictions concerning the issues studied, are delineated below. Also, references are made to the chapters in question.

1. *To what degree does the reporting of bodily signals in hypochondriacal patients vary as a result of attentional focus and distraction?*

According to the model, an increased focus on one's body and an enhanced bodily perception are part of the cognitive characteristics of hypochondriasis. Salkovskis and Clark (1993) claim that anxiety causes an increase in vigilance which, in turn, results in the perception of bodily sensations. As for the disorders maintenance, an increased focus on one's body is thought to encourage preoccupation with perceived bodily changes, followed by misinterpreting them as indicators of a serious health threat. Although the model suggests heightened baseline levels of attention and perception of bodily signals in hypochondriacal subjects, it does not, however, allow predictions concerning the variability of these levels in different conditions. Therefore, in the first study, described in Chapter 4, this matter is investigated. Symptom reporting in hypochondriacal patients is compared with that seen in control subjects under attention, distraction and control conditions, without using any means of physical stimulation.

2. *Can enhanced reporting of bodily signals in hypochondriacal subjects be explained by enhanced bodily sensitivity?*

It seems plausible that one's sensitivity to bodily cues matters in the development and maintenance of hypochondriacal problems. Previous research has led some authors to conclude that hypochondriacal subjects are better able to detect normal physiological sensations, whereas others have stated the opposite. The cognitive-behavioural model is silent about this issue. The second study in this thesis, described in Chapter 5, addresses the sensitivity issue. It deals with an objective means of measuring tactual sensitivity to non-painful stimuli in order to investigate whether increased sensitivity can (partly) account for the enhanced bodily perception in hypochondriasis mentioned in the cognitive-behavioural model.

3. *Is merely suggesting bodily sensations sufficient to induce their reporting in hypochondriacal subjects?*

Chapter 6 presents another study based on the model's assumption that hypochondriacal subjects tend to be overly attentive, perceptive and reportive with regard to bodily signs and sensations, resulting in preoccupation with and misinterpretation of these. Apart from any attentional and sensitivity anomalities investigated in the first two studies, it might be that hypochondriacal persons are highly suggestible as far as internal cues are concerned. In other words, it could be that their heightened symptom reporting not only reflects heightened awareness of actual internal cues caused by heightened attention or sensitivity. In addition, it may be that the pure suggestion of physical stimuli suffices in encouraging symptom reporting in hypochondriacs. To clarify this issue, it is investigated whether merely announcing the physical stimulation of a particular bodily part will prove sufficient in evoking sensation detection and reporting in hypochondriacs, while leaving controls unaffected.

4. *What do hypochondriacal subjects who fear cancer actually know about the disease? Does their knowledge base give proof of a processing bias towards negatively valued information?*

5. *When presented with medical information about a serious disease, do hypochondriacs profit as much from it as healthy controls do? Do hypochondriacal subjects demonstrate a preference for processing negative information? And, in addition, do they show a reluctance to process positive information?*

According to the cognitive-behavioural model, information about serious illnesses is one of the possible stimuli triggering threat perception in hypochondriacs. Within the vicious circle that follows, verbal information about health and illness is said to be selectively attended to, catastrophically misinterpreted and transformed. Chapters 7 and 8 present two studies investigating whether these information-processing characteristics are reflected in the current level of cancer knowledge in hypochondriacal patients, as well as in their knowledge growth resulting from an experimental cancer education video. In addition, it is studied whether hypochondriacs give proof of catastrophizing medical information, as appears from threat agreement and safety disagreement. The expected increase in physiological arousal is also included in the measurements.

6. *Do hypochondriacal subjects show a general bias towards perceiving danger, or is this bias limited to health issues? Is the assumed information processing bias reflected in the way hypochondriacal subjects respond to messages suggesting threat or safety?*

According to the model, negative automatic thoughts and imagery play a central role in the development and maintenance of hypochondriasis. They are said to be reflected by habitually overestimating the seriousness of bodily sensations and health risks, and by being more responsive to threat messages and less responsive to safety messages. The last study, presented in Chapter 9, further examines this aspect. It starts with investigating danger estimation in ambiguous health-related and non-health-related events in patients and controls. Elaborating on the presumed bias towards ignoring positive information while acknowledging negative

information, the study investigates whether hypochondriacal patients show more increase in danger estimation following additional threat messages, and less decrease in danger estimation following additional safety messages, than controls do.

To summarize, our separate studies addressed the following cognitive aspects of the model:

studies 1, 2, and 3	⇦	**Focus on body and enhanced bodily perception**
studies 4, 5, and 6	⇦	**Attention to negative information**
studies 4, 5, and 6	⇦	**Discounting positive information**

Chapter 4

Hypochondriasis and symptom reporting: the effect of attention versus distraction

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Psychotherapy and Psychosomatics (1996), 65, 43-48

Abstract

The present study examines symptom perception in hypochondriacal patients without physical stimulation. The sample consisted of 17 patients with hypochondriasis and 16 healthy control subjects who were asked to report perceived sensations in three conditions: attention, distraction and control. It was found that hypochondriacal subjects showed remarkably higher levels of symptom reporting than healthy subjects in all three conditions. In spite of excessive attention to bodily sensations in a control condition, attention instructions still added significantly to symptom reporting in hypochondriacal patients. The effect of distraction was not significant in either of the groups. Furthermore, group differences in symptom reporting appeared to be related to preoccupation with bodily symptoms rather than to general anxiety level as measured by the STAI.

Introduction

Hypochondriasis is characterized by a preoccupation with the fear of having, or the idea that one has, a serious disease, based on the person's misinterpretation of bodily symptoms [1]. Also, false beliefs about disease are quite common in hypochondriacal subjects [2]. In their cognitive model of health anxiety and hypochondriasis, Warwick and Salkovskis [3] state that bodily signs and symptoms are not only perceived as more dangerous than they really are, but also that a particular illness is believed to be more probable than it really is.

Hypochondriacal patients not only have incorrect ideas about illness, they also seem to experience bodily sensations in a different way as compared to non-hypochondriacal persons. This was demonstrated by Barsky et al. [4] who asked two groups of patients to what extent they were bothered by various uncomfortable sensations. The results indicated that hypochondriacal patients show a stronger tendency to experience visceral and other somatic sensations as unusually intense, noxious and disturbing than a medical out-patients' clinic control group. Besides, hypochondriacal patients regard more somatic symptoms as indications of a disease than non-hypochondriacal patients [5]. Ambiguous bodily sensations, then, are easily misinterpreted and considered to be symptoms indicating illness [6]. For example, hypochondriacal subjects fearing cancer can be assumed to often and easily misinterpret concrete bodily sensations and signs as an indication that they have cancer [7].

It is not clear yet, whether the above-mentioned beliefs and interpretations are related to attentional dysfunctions. As was stated by Kellner et al. [2], hypochondriacal patients attend more to bodily sensations when these are being perceived. Hypochondriacal subjects seem to filter their somatic perceptions and focus on weak and infrequent bodily sensations. By doing so, they are thought to amplify normal physiological sensations [4]. In addition, they feel unable to divert their attention when experiencing symptoms, and when reading or hearing about a disease they are strongly aware of bodily symptoms.

Attention, on its own, can be a powerful means of intensifying somatic sensations in both healthy [8] and hypochondriacal subjects [9]. Even when no physical sensations are perceived, hypochondriacal patients are believed to scan for information which appears to confirm the idea of having an illness. Moreover, evidence indicating good health is selectively reduced or disregarded [3]. Worrying about the possible meaning or health threat of experienced bodily symptoms frequently occurs.

Schmidt et al. [10] showed experimentally that directing the attention of healthy subjects to specific bodily sites makes sensations more salient. The question remains whether patients with hypochondriasis typically attend to whatever they feel inside their bodies. It may be assumed that hypochondriacal patients constantly attend to their body in daily life. They instruct themselves, so to speak, to be alert. As a result, they will experience more bodily changes or sensations than healthy subjects. From this, it can be predicted that instructing hypochondriacal patients to attend to bodily sensations will not add significantly to the intensity of reported sensations. On the other hand, following this theory, distraction will reduce symptom reporting to a level comparable to that found in (distracted) healthy subjects.

In order to shed light on this issue we carried out an experimental study focussing on symptom reporting resulting from attention directed to (a) and away from (b) bodily sensations and a control condition (c). Our approach differs from Schmidt et al. in that attention is directed to physical symptoms in general rather than to a specific bodily site. The present article presents one of two studies in which both hypochondriacal patients and panic patients participated. The results with regard to panic disorder will be reported separately by Kroeze, Van den Hout, Haenen and Schmidt (*unpublished data*).

The following three hypotheses were tested:
Hypothesis 1. In the control condition, hypochondriacal patients will report more intense bodily symptoms than healthy subjects;
Hypothesis 2. Directing attention to internal stimuli will cause a smaller increase in symptom reporting in hypochondriacal patients than in healthy subjects;
Hypothesis 3. Distraction will cause a greater decrease in symptom reporting in hypochondriacal patients than in healthy subjects.

Method

Subjects

Subjects were 17 hypochondriacal patients (5 males and 12 females) and 16 healthy control subjects (5 males and 11 females). Both groups were recruited via an advertisement in a local newspaper, in which men and women were asked to take part in experimental research. Hypochondriacal patients were selected via an advertisement in which some characteristics of hypochondriasis were mentioned (complaints, anxiety or disease conviction, anxiety remaining despite medical reassurance). Seventeen subjects met the DSM-III-R criteria for hypochondriasis, as was determined by a health psychologist using the Structured Diagnostic Interview for Hypochondriasis (SDIH) [11]. All of these subjects consulted doctors (both general practitioners and specialists) on a more or less frequent basis. None of them was receiving psychological treatment at the time of the study. The mean age of the hypochondriacal group was 47.0 years (SD=10.8; range 33-65). The healthy subjects reacted to an advertisement in which the presence of good health was stressed. After screening for the absence of health problems and health related worries, seventeen healthy Ss (matched for age and sex) were admitted to the experiment. One healthy subject was excluded from the analyses because she did not show up at the experiment. Mean age of the remaining Ss was 48.3 years (SD=12.2; range 25-64). Groups did not differ in level of education.

Statistical Methods

T-tests were used to compare mean scores on self-rating measures between hypochondriacal subjects and healthy controls. Symptom reporting scores were analysed via a 2 (Group) x 3 (Condition) MANOVA with repeated measures, using state anxiety as covariate. Significance values were $p =< 0.05$ (two-tailed).

Assessment

Levels of state and trait anxiety were measured using the *State-Trait Anxiety Inventory* (STAI) [12], a 40-item inventory measuring self-reported state and trait anxiety. State anxiety measures momentary anxiety: a transitory emotional condition which varies in intensity and fluctuates in time as a reaction to a certain situation. Trait anxiety refers to a stable and enduring individual difference in anxiety proneness. State and trait scores range between 20 and 80.

Symptom perception was scored on a *symptom checklist* consisting of 47 items. All items referred to physical sensations in certain parts of the body. Items were scored on a 5-point scale, ranging from '0' (absent) to '4' (very strongly present).

Estimated fear of physical sensations was measured using the above-mentioned symptom checklist, asking how anxious Ss expected to be when experiencing each of the sensations. Items were scored on a 5-point scale, ranging from '0' (not afraid) to '4' (very much afraid).

Procedure

Hypochondriacal and control subjects followed the same procedure. During the experiment the Ss were sitting in a comfortable chair that was placed in a sound-attenuated room. After entering the laboratory, Ss were asked to complete the state anxiety questionnaire. Subjects were informed about the general outline of the experiment.

Three conditions were presented in random order:

In the *control condition* Ss were told that the experimenter had to fill in some forms and that the experiment would be continued after a short break. No external stimulation was provided. In the *attention condition* Ss were instructed to close their eyes and focus on all bodily sensations they were experiencing (without specifying bodily sites). No external stimulation was provided.

In the *distraction condition* Ss were given a set of 12 photographs showing picturesque scenes of people living and working in different cultures. Ss were asked to describe each photograph at their own pace and then to continue with the next one.

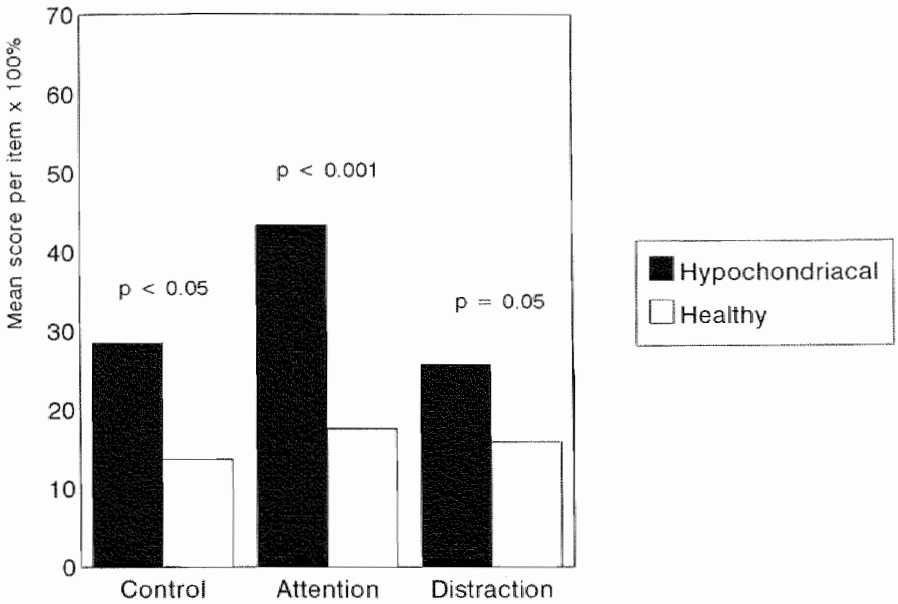
Instructions were given verbally by the experimenter. Each condition lasted for two minutes (which is the same procedure as the one followed by Schmidt et al.), after which Ss completed the symptom checklist.

It is quite possible that the subjects want to appear consistent in their answers on the checklist. To make occurrence of such attempts at consistency less likely, we used an electromyotron registration. Ss were told that the researchers were studying the interpretation of myotron scores by comparing them with checklist scores. After participating in the three conditions Ss filled in the trait anxiety questionnaire and the symptom checklist version asking about expected fear levels. They were then debriefed. The duration of the experiment was approximately one hour. All subjects received a small financial reward.

Results

The main effects for Group ($F(1,31) = 9.45$; $p < 0.005$) and Condition ($F(2,30) = 8.73$; $p < 0.001$) were significant, as was the interaction for Group x Condition ($F(2,30) = 5.75$; $p < 0.01$). Contrary to what had been predicted, the results show a significant increase in symptom reporting in hypochondriacal Ss in the attention condition compared to the control condition [$t(16) = -3.00$, $p < 0.01$] and only a marginally significant increase in non-hypochondriacal Ss [$t(15) = -1.95$, $p = 0.07$]. In both groups, symptom reporting under distraction did not differ significantly from that in the control condition. Mean scores for each condition are shown in Figure 1.

Figure 1. Intensity of bodily symptoms (47 items). Comparing control, attention and distraction condition



Furthermore, we calculated discrepancies in the two groups by subtracting mean scores in the attention condition from mean scores in the control condition. Again, the increase in symptom reporting was significantly higher in the hypochondriacal group [$t(31) = 2.02$, $p = 0.05$]. When subtracting mean scores in the distraction condition from mean scores in the control condition in both groups, these discrepancy scores did not differ significantly.

Group differences

The group effect was further analysed. It could be argued that hypochondriacal subjects were more anxious during the experiment, which might have caused higher levels of symptom reporting regardless of the condition. Therefore, we examined the mediating role of state and trait anxiety. There were significant group differences in state and trait anxiety. State anxiety was significantly higher [$t(31) = 3.28$, $p < 0.005$] in the hypochondriacal group ($M = 43.8$; $SD = 14.1$) than in controls ($M = 31.0$; $SD = 7.0$). Trait anxiety, too, was higher [$t(31) = 4.15$, $p < 0.000$] in hypochondriacal patients ($M = 49.0$; $SD = 10.5$) than in controls ($M = 34.6$; $SD = 9.2$). State anxiety was significantly correlated with intensity of perceived physical sensations in the control ($r = 0.58$, $p < 0.001$), attention ($r = 0.47$, $p < 0.01$) and distraction ($r = 0.67$, $p < 0.001$) conditions. There were no correlations with trait anxiety. In a MANOVA with repeated measures we therefore used state anxiety as a covariate. A significant main effect for Group was no longer present ($F(1,30) = 2.07$; $p = 0.160$), which indicated that hypochondriacal Ss showed more intense symptom reporting in all three conditions due to higher state anxiety. However, some of the STAI-items used to measure state anxiety may be taken to relate to bodily sensations (e.g. being nervous). In this way, these items measure the same issue as the dependent variable, i.e. bodily sensations. For this reason, we analysed parts of the state questionnaire separately. Using only the items that refer to bodily sensations as covariate, again no significant main effect for Group was found ($F(1,30) = 2.01$; $p = 0.167$). However, a MANOVA carried out on the items that do *not* refer to bodily sensations (such as feeling safe), left the group effect mentioned earlier intact ($F(1,30) = 2.98$; $p < 0.05$). Hence, group differences in symptom reporting were related to preoccupation with bodily symptoms rather than to general anxiety level as measured by the STAI.

Condition effect

As we expected, both groups showed their highest levels of symptom reporting in the attention condition. Directing Ss's attention to internal sensations increased the saliency of the sensations as well as the intensity of perceived symptoms. When no instructions were given as well as under distraction less symptoms were reported ($F(2,30) = 8.73$; $p = 0.001$).

Interaction effect

We hypothesized that hypochondriacal patients constantly attend to internal sensations, due to their preoccupation with their body, even in the absence of instructions to do so. As a consequence, instructions aiming at actively directing attention to internal sensations would not add to symptom reporting in the control condition in hypochondriacal subjects as much as it would in healthy subjects. This was not the case, however. Hypochondriacal patients appeared to be *more* sensitive to the attention instructions given than the healthy group. When asked to concentrate on internal bodily sensations, reporting increased dramatically in the hypochondriacal group, whereas symptom reporting seemed less influenced by these instructions in the healthy group ($F(2,30) = 5.74$; $p < 0.01$).

As has been mentioned before, both groups showed an increase in perceived symptom intensity when asked to concentrate on internal sensations. Further analysis revealed that only in hypochondriacal subjects an increase in reported symptom *diversity* was found as well [$t\ (16) = -3.36$, $p < 0.005$].
When instructed to attend to internal stimuli, the patient group may have noticed several symptoms which were not typical objects of fear in hypochondriasis. Due to this general sensitivity, a variety of sensations may have been reported in the attention condition; sensations relevant to hypochondriacal pathology (i.e. symptoms easily associated with serious diseases like cancer or heart disease) as well as not relevant ones. From the symptoms mentioned in the checklist, we selected the ones that proved to evoke significantly more fear in hypochondriacal subjects than in healthy controls (see *Assessment*), using a Mann-Whitney test ($p < 0.01$). The resulting shorter version of the symptom checklist consisted of 15 'hypochondriasis-relevant' items (see Table 1).
The remaining 32 items were labelled 'hypochondriasis non-relevant' (e.g. being hungry, being thirsty, pain in the knees, feeling comfortable or tired). Comparing scores of hypochondriacal subjects in the control and attention conditions by means of paired t-tests revealed a significant increase in the reporting of hypochondriasis-relevant symptoms [$t\ (16) = -2.97$, $p < 0.01$] as well as in the reporting of hypochondriasis non-relevant symptoms [$t\ (16) = -2.25$, $p < 0.05$], which indicates a non-type-specific increase. In other words, in the attention condition hypochondriacal patients are more sensitive to hypochondriasis relevant as well as to hypochondriasis non-relevant sensations than in the control condition. Moreover, it became clear that the latter type of sensations were experienced more strongly by the patient group in the attention condition only [$t\ (31) = 2.94$, $p < 0.01$]. In both the control and the distraction conditions no significant differences between the two groups were found in the reporting of hypochondriasis non-relevant symptoms.

Table 1. Hypochondriasis-relevant items of the symptom checklist

problems with breathing deeply enough	*
pain in the shoulders	**
a pounding heart	**
a quicker or deeper respiration	**
a bad taste	*
pain in the arms	**
chest pain or discomfort	***
trembling	**
accelerated heart rate	***
paresthesias	**
shortness of breath	*
feeling restless or tense	***
pain in the neck	**
chest discomfort	***
lightheadedness	***

* $p < 0.01$ ** $p < 0.005$ *** $p < 0.001$

Discussion

In our study hypochondriacal subjects reported more bodily sensations than healthy controls when no instructions were given. This finding is in line with Tyrer and Alexander [13] who demonstrated an increased awareness of cardiac activity in hypochondriacal patients. Similar effects have been found in agoraphobics, who generally appear to be more aware of internal bodily sensations than controls [14].

Our results are in line with Pennebaker [8] and Schmidt et al. [10], who demonstrated that simply directing a persons attention to bodily sensations increases reporting of symptoms. Directing attention inwards appeared to add significantly to perceived symptoms in the hypochondriacal group, whereas in the control group there was a trend towards an increase in symptom reporting. In other words, despite a relatively high baseline, hypochondriacal Ss's symptom reporting appeared not to have reached its maximum level yet.

It might be that the results of our patient group cannot be generalized. However, all subjects met diagnostic criteria for hypochondriasis; they were seriously worried about their health, with feelings of anxiety and depression being evident in most of them. As such these patients can be regarded as representative of hypochondriacal patients in general. Only one subject had, in the past, received psychological treatment. Following DSM-IV criteria, the remaining subjects may be diagnosed as hypochondriacal patients 'with poor insight'. With respect to the experimental conditions, the fact that these lasted no more than two minutes may have limited symptom reporting. It could well be, that subjects need more time for our general suggestive instruction to lead to a significant increase in symptom reporting.

With respect to the attention condition it should be noted that, in the healthy control group, we could not replicate a significant increase in symptom report as was found by Schmidt et al. A possible explanation is the difference in instructions given. Schmidt et al. asked their subjects to attend to a specific bodily site and to reported the sensations felt in that area, whereas our instructions were far less specific. Asking subjects to concentrate on a specific area is probably more stimulating and a better way to study the influence of attention on sensations.

The fact that distraction did not reduce symptom reporting in healthy subjects may imply that this condition did not provide enough distraction. In addition, describing photographs may have elicited physical symptoms. Another explanation may be that there is a bottom effect, i.e. in healthy subjects symptom reporting was already at a very low level in the control condition.

Fava [15] mentions a resistance to medical reassurance as being the most distinct characteristic of hypochondriasis. As such, our patient group not only amplifies somatic sensations but also belongs to, as Fava describes it, 'the most severe part of the spectrum' because reassurance from general practitioners has done little to alleviate their distress.

In their study Otto et al. [16] demonstrated a clear resemblance between the fear of anxiety symptoms in panic disorder and the fear of somatic sensations in hypochondriasis. Anxiety sensitivity is concluded to be the best predictor of hypochondriacal concerns. Starcevic et al. [17] measured hypochondriacal tendencies and attitudes in both patients with panic disorder and patients with

generalized anxiety disorder. The authors conclude, that hypochondriacal fears and beliefs as well as anxiety sensitivity, are far more common in patients with panic disorder than in the generalized anxiety group. In line with this, the present data show that the majority of those sensations feared significantly more by hypochondriacal subjects, can be identified as being characteristic for panic attacks according to DSM-IV criteria.

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Chapter 5

Tactual sensitivity in hypochondriasis

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Psychotherapy and Psychosomatics (1997), 66, 128-132

Abstract

In his article on amplification, somatization and somatoform disorders Barsky [1] pointed out the importance of studying the perception and processing of somatic and visceral symptoms. Subsequently, it was demonstrated [2] that hypochondriacal patients are not more accurately aware of cardiac activity than a group of non-hypochondriacal patients. Authors concluded that hypochondriacal somatic complaints do not result from an unusually fine discriminative ability to detect normal physiological sensations that non-hypochondriacal patients are unable to perceive. The aim of the present study was to investigate tactual sensitivity to non-painful stimuli in hypochondriacal patients and healthy subjects. Twenty-seven outpatients with DSM-III-R hypochondriasis and 27 healthy control subjects were compared. In all subjects the two-point discrimination threshold was measured, as well as subjective sensitivity to harmless bodily sensations as measured by the Somatosensory Amplification Scale (SSAS).

It was found that hypochondriacal patients reported more distress and discomfort with benign bodily sensations. The two-point discrimination threshold of hypochondriacal patients was not significantly lower in patients as compared to controls. Hypochondriacal subjects considered themselves more sensitive to benign bodily sensations without being better able to discriminate between two tactual bodily signals. These findings of the present study correspond quite closely to those reported earlier [2].

Introduction

In recent years researchers have focussed on hypochondriasis and the remarkable reporting of symptoms that seems to go with it. Two possible explanations for this phenomenon have been mentioned. The first hypothesis is that differences in attitudes and attention in hypochondriacal subjects lead to an increase in symptom perception without any bodily substrate [2,3]. The second hypothesis states that hypochondriacal patients are more sensitive interoceptors. In other words, their behaviour results from an increased sensitivity of the nervous system to somatosensory input [4,5]. A number of laboratory paradigms have been used to investigate the latter issue, both for interoceptive and externally produced stimuli. In some of these studies hypochondriacal patients were compared to normal controls; in others, different patient groups served as a control group.

Evidence confirming the latter hypothesis seems to be scarce. Tyrer and Alexander [5] found higher correlations between objective pulse rate and estimated heart rate in hypochondriacal psychiatric out-patients as compared to phobic out-patients. No such differences were found comparing hypochondriacs to patients with anxiety neurosis. Authors consider an increased awareness of bodily function to be the underlying cause. Recently however, Barsky et al. [2] could not confirm these findings. It was investigated whether hypochondriacal patients were more accurate perceivers of cardiac activity than non-hypochondriacal patients. Authors concluded that even though the first group rated themselves as significantly more sensitive to normal physiological sensations and minor bodily symptoms, objective performance did not verify this. It appeared that hypochondriacs' sensitivity was merely based on the patient's believes instead of the objective facts.

Other studies used external stimuli to measure sensitivity of the nervous system in hypochondriasis. Visual two flash fusion and absolute auditory threshold tasks served as arousal measures in the Hanback and Revelle [4] study. Those students scoring high on a hypochondriasis scale were better able to resolve a double flash than low hypochondriacal students, whereas no differences were found for the auditive sensitivity. Authors claim that in hypochondriasis a lowered threshold for physical signals causes an increase in interoceptive input. However, the method used for measuring auditive sensitivity has been criticized by Robinson [6] stating that an auditory task presenting stimuli in a spaced or paired manner would have been more appropriate to demonstrate convergent validity for the auditory and the visual measures. In addition, one might argue that when studying hypochondriasis, the clinical validity of both auditory and visual stimuli is limited. Using tactual stimuli seems to be far more relevant when studying this kind of psychopathology, as tactual stimuli cause somatic sensations, while auditive and visual stimuli do not.

Measuring the two-point discrimination threshold for non-painful tactual stimuli in chronic pain patients, Seltzer and Seltzer [7] found these patients to have higher thresholds and thus to be less sensitive to non-painful tactual stimulation than control subjects. Because of methodological weaknesses, Peters and Schmidt [8] improved the Seltzer and Seltzer procedure in order to measure two-point discrimination thresholds for tactual stimuli without any psychological response bias. In their study no evidence was found that chronic low back pain patients

were less sensitive to non-painful stimuli.
The primary aim of the present study was to compare tactual sensitivity thresholds in hypochondriacal patients and a matched group of healthy controls using the Peters and Schmidt method. If hypochondriacs are more sensitive in tactual perception, then their threshold levels will be lower than those in the control group.

Method

Subjects

Twenty-seven patients (12 male, 15 female) with hypochondriasis, according to the criteria of DSM-III-R [9] participated in the study. Hypochondriacal patients were selected via an advertisement in a local newspaper[1] in which some characteristics of hypochondriasis were mentioned (complaints, anxiety or disease conviction, anxiety remaining despite medical reassurance). Thirty-six Ss were interviewed by the first author using the Structured Diagnostic Interview for Hypochondriasis (SDIH) [10], of whom 27 subjects were admitted to the patient group. Mean age of the patient group was 49.0 years (SD=12.1; range 22-67). At the time of the study, the patients were not receiving any psychological treatment. The control group consisted of 27 healthy subjects (12 male, 15 female) who reacted to an advertisement in which the presence of good health was stressed. After screening for the absence of health problems and health related worries[2], 27 healthy Ss were admitted to the experiment. Mean age of the Ss was 49.7 years (SD=12.6; range 21-70). Groups were matched for sex, age and level of education. Sixteen hypochondriacal subjects and four controls were taking medication, either (psycho-)pharmacological or natural drugs. Groups differed significantly on this matter (χ^2 = 11.4, $p < 0.001$). All subjects were right handed. Subjects were paid after participation.

Assessment

Before entering the experiment subjects filled in the *Somatosensory Amplification Scale* (SSAS) [11] which is a self-report questionnaire used to assess perceived sensitivity to mild bodily sensations which are uncomfortable but which are not considered as typical symptoms of serious disease. The instrument has 10 items scored on a five-point ordinal scale, a test-retest reliability of 0.79 and an internal consistency of 0.82. It has been demonstrated that amplification is significantly associated with a self-report symptom inventory. Upon arrival in the laboratory subjects rated their level of state anxiety on a *visual analogue scale* (VAS; 0=not anxious at all; 100=very anxious).

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[1] In the advertisement fear of cancer was mentioned as well. This was done because part of the study focussed on this theme.

[2] We used a simple screening list asking for the following facts: Do you have any complaints about your health? Do you have an illness which has been diagnosed by your doctor? Are you being treated or have you been treated recently for an illness? Are you concerned about your health? All of these questions had to be answered "No" in order to be considered 'healthy'.

Statistical Methods
T-tests were used to compare mean SSAS scores and mean discrimination threshold scores. An ANCOVA was carried out to control for anxiety level differences between groups. Significance values were $p =< 0.05$ (two-tailed).

Apparatus
The two-point discrimination test was performed on all individuals, using a standard navigation compass that was also used in an earlier study [8]. With this instrument the experimenter is able to produce non-painful tactual stimuli adjusted to distances between 0 and 15 cm. The various distances were determined with an exactness of 1 mm and were measured along a fixed ruler.

Procedure
The discrimination test was presented twice, with subjects filling in the *Multidimensional Health Locus of Control scale* [12] (as part of another study) in between. After the procedure had been explained Ss were blindfolded and asked to put their right arm flat on the table with the palm of the hand up. The skin area used for testing was determined by measuring the forearm from wrist to elbow. Halfway along a dot was placed around which all stimuli were centered lengthwise. In cases of only one point of stimulation, the compass touched the skin at the dot itself.
First the subjects' global sensitivity was tested in order to choose between presenting a high or a low range of distances. Six pretest trials, 1, 50, 57, 1, 54 and 48 mm were delivered. If the subject correctly identified three out of four large intervals, the low range (10 to 50 mm) was applied. If not, the high range (40 to 80 mm) was applied. Both parts of the test consisted of 50 trials which were presented in a fixed random order with an interstimulus interval of approximately 5 seconds. This order was the same for the high and the low ranges; 30 mm was added to the stimuli of the low range to obtain the high range. The 50 trials were subdivided into 41 test trials and 9 catch trials. In the test trials every mm between 10 and 50 mm (low range) or between 40 and 80 mm (high range) was presented once. Nine catch trials were administrated; eight one-point stimuli and one stimulus of very large distance (60 mm in the low range and 90 mm in the high range). After each trial subjects had to indicate whether they felt one or two points of stimulation. In case of doubt they had to make a choice. After every 10 stimuli, the experimenter firmly stroke the subject's arm a few times to prevent interference from any residual sensations from previous stimuli. The same procedure was followed the second time, only now the same stimulation distances were presented in backward order.

Scoring
Following the procedure of Peters and Schmidt [8], a subject scored every distance twice (once in every series), giving a total of 100 scores (including 18 catch trials). Catch trials were used as a control for the reliability of the method, as well as a measure of the ability of the subject to respond correctly. The remaining 82 scores were arranged along an ascending axis, with somewhere along

this axis the two-point discrimination threshold. Theoretically, every distance below this point should be reported as one stimulation point, and every distance above it as two distinct stimulation points. For each subject, somewhere along the axis there is an area in which scores become inaccurate and 1's and 2's are alternated. The 'true' two-point discrimination threshold was then determined in such a way, that the number of incorrect responses on both sides of this point was equal.

Results

The mean SSAS score per item was higher in DSM-III-R hypochondriacs than in the control group: 2.91 (SD=0.81; range 1.4-4.4) vs. 2.09 (SD=0.54; range 1.3-3.2) [$t(52) = 4.44$, $p < 0.001$][3]. Global sensitivity measurement resulted in the same distribution within both groups: 14 (13) subjects received the high (low) range distances. The threshold results of 3 subjects (1 patient and 2 controls) had to be omitted. One control subject appeared to be too sensitive so we could not determine the threshold. In both groups one subject's scores were considered unreliable as more than four out of eighteen 'catch-trials' were missed. The remaining 51 subjects received a total of 918 'catch trials', of which 47 were scored incorrectly (5.1%). Ninety-five percent of the times the responses were accurate in the control group, 94% in the hypochondriacal group. Individual thresholds were averaged to obtain a mean discrimination threshold per group. The mean discrimination threshold of the control group was 48.0 mm (SD=14.9; range 25.0-76.5; no outliers), that of the hypochondriacal patients was 44.8 mm (SD=15.6; range 12.5-73.0; no outliers). A t-test for unpaired observations showed that this difference was not statistically significant [$t(49) = -0.75$, $p = 0.46$]. There was no main effect for gender. At the start of the experiment hypochondriacs rated themselves to be significantly more anxious (M=25.0; SD=27.3) than control subjects (M=7.0; SD=10.2) $t(52) = [3.21, p < 0.005]$. For that reason an ANCOVA was carried out, using anxiety level as a covariate. Again, no differences in threshold levels were found between hypochondriacal patients and controls ($F(1,48)=0.99$; $p=0.325$), indicating that threshold scores were not influenced by anxiety.

Discussion

Previous research has been contradictory as far as physical sensitivity in hypochondriasis is concerned. The present study was conducted in order to find out whether hypochondriacal patients were more sensitive to tactual stimuli, using a measure free of response bias. We compared this objective measure (threshold level) to a subjective measure (SSAS) of bodily perception. Whereas in other stu-

[3] Barsky [2,11] found similar mean scores in his hypochondriacal population: 2.78 (SD= 0.67) and 3.05 (SD=0.79) respectively.

dies control groups consisted of students or non-hypochondriacal patients, in our study hypochondriacal patients were compared to matched healthy controls selected for age, sex and education level. In contrast to our hypothesis, it appeared that hypochondriacal subjects reported to be more sensitive to bodily discomfort, without being able to discriminate better between tactual stimuli. As such, no evidence was provided for the sensitivity hypothesis.

How should these results be explained? Our finding corresponds with the results obtained in earlier experiments demonstrating no differences between hypochondriacal subjects and controls in awareness of heartbeat [2] and sensitivity to auditive stimuli [5]. Our patient group appears to be characterized by a personal belief that one is quite sensitive to bodily sensations, possibly as a consequence of bodily preoccupation [13,14,15]. By actual assessment however, we found no objective evidence for increased somatic sensitiveness.

Some remarks are in order as to the interpretation of the current findings. As described earlier, we selected our patient group by means of a newspaper advertisement in which fear of cancer was mentioned. It could be, that this method caused a selection bias. However, all of our patients met DSM-III-R criteria for hypochondriasis. Moreover, SSAS scores in our hypochondriacal group are in between scores found by Barsky in two earlier studies [2,11]. As such, both patient groups are comparable.

Also, our population was approximately six years older than the Peters and Schmidt group. Mean threshold score for healthy subjects in the latter study was somewhat lower. There is, however, no reason to assume that age differences caused different results.

It should be taken into consideration that in our patient group more subjects were on medication. Because of this, one may argue that in the hypochondriacal group true sensitivity levels were masked by the use of medication. For that reason we compared threshold scores within the patient group. No differences were found between those patients using medication ($n=16$) and those without medication ($n=11$). It seems therefore, that the use of medication had no effects on discriminative ability.

It should be noted that, although the clinical interview did not imply any psychiatric comorbidity, this has not been explicitly examined in this study. Future studies should include assessment of additional diagnoses.

Bodily sensitivity can be measured in different ways. We used discrimination thresholds as a measure of bodily sensitivity. It may be that the instrument we used can not measure subtle differences. It may also be that no differences in sensitivity were found because in this patient population the arm is not an anxiety relevant bodily part. Stimulation of more illness related bodily parts might increase clinical relevance, revealing perceptual differences caused by underlying specific sensitivity. Yet focussing on such parts makes it more difficult to exclude response tendencies.

Furthermore, the ability to discriminate between two stimuli is only one aspect of sensitivity. It could be that during the experiment hypochondriacal subjects, as compared to controls, experienced the stimuli in a higher intensity without being more able to discriminate between the two dots. In order to clarify this

issue a study is needed using a different set up in which both the intensity of the tactual stimuli and the intensity of the distractor can be varied.
Findings with the SSAS should be interpreted with care, as the construct validity of the questionnaire has not been extensively investigated. The SSAS focusses on cues that may not be at the same level of specificity as the two-point discrimination test used in this study.
Finally, findings on perception of tactual stimuli may not necessarily be generalizable to (all) internal stimuli. On the other hand, in order to measure bodily sensitivity without the interference of cognitive factors, one needs to study a part of the body that is not the focus of anxiety.
In sum then, we found no evidence for an increase in tactual sensitivity in hypochondriacal patients. The most plausible conclusion seems to be that cognitive appraisal of sensations is a central issue here. Warwick and Salkovskis [16] state that hypochondriacal patients tend to misinterpret internal bodily symptoms as indicating severe illness. One might speculate that, whenever these patients feel something inexplicable to them inside their bodies, it is likely to evoke fear and irritation. As such they are high responders but not better 'detectors'. For example, not being able to differentiate between actual cancer warning signals and non-warning signals causes a situation in which *all* bodily sensations are potentially threatening and, because of that, deserve full attention. It seems worthwhile to investigate the level of accurate knowledge in hypochondriacal patients and its possible role in symptom reporting intensity.

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Chapter 6

Suggestibility in hypochondriacal patients and healthy controls: an experimental case control study

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Psychosomatics (1997), 38, 543-547

Abstract

This study examined suggestibility to bodily sensations in hypochondriacal patients and healthy subjects. Both groups participated in an experiment in which electrical current was announced but not delivered. Suggestibility was measured by the number of responses as well as by response latencies. It was hypothesized that hypochondriacal patients would be more easily influenced by the expectation of a forthcoming stimulus, leading to higher and quicker 'stimulus detection' than healthy subjects. In contrast to these expectations healthy subjects showed higher response frequencies and lower response latencies. Hypochondriacal patients thus appeared to be less influenced by the expectation that was raised. The theoretical and clinical implications of the results are discussed.

Introduction

It has been investigated whether symptom reporting in hypochondriasis might be best explained by physiological sensitivity[1-3], somatosensory amplification[4] and cognitive misinterpretation[5] or by anxiety and response bias[4,6]. If physiological differences are a key issue, one might consider increased symptom reporting in hypochondriacs to be caused by heightened bodily sensitivity, in other words: perception is increased but reporting is adequate. A number of laboratory paradigms have been used to investigate this issue, using either interoceptive or externally produced stimuli. However, evidence confirming the physiological hypothesis seems to be lacking when it comes to perception of cardiac activity[3] and auditory sensitivity.[1] Moreover, in a study on tactile sensitivity in hypochondriacal patients and normal controls[7], it was found that the two-point discrimination threshold of hypochondriacal patients was not significantly lower. On the other hand, psychological differences could be responsible for the increased symptom reporting in hypochondriacs. As such, a tendency to overreport might reflect somatic amplification.[4] In that case, perception is adequate but reporting is exaggerated.

In order to investigate response tendencies we tried to find a paradigm suited to experimentally demonstrate overreporting in these patients. Therefore we studied the impact of merely *suggesting* bodily sensations in patients suffering from hypochondriasis. Prior to testing, Pauli, Schwenzer, Brody et al.[8] suggested a painful stimulus would occur during the second part of a concentration-performance test. It was found that expectancy of a forthcoming pain stimulus reduced performance of high hypochondriacal subjects in both the first and the second part of the test. Low hypochondriacal subjects showed an attentional bias towards the pain stimulus in the second part of the test only. In the present study, we predicted the patient group would 'detect' and report an announced *but not actually delivered* electrical stimulus more frequently than healthy controls. In addition, it was hypothesized that response latencies would be lower in hypochondriacs.

Methods

Subjects

Twenty-seven hypochondriacal subjects (12 male, 15 female) according to DSM-III-R criteria[9] participated in the study. Subjects were selected via an advertisement in a local newspaper in which some characteristics of hypochondriasis were mentioned (complaints, anxiety or disease conviction, anxiety remaining despite medical reassurance)*.

Subjects were interviewed by the first author using the Structured Diagnostic Interview for Hypochondriasis (SDIH).[10] Mean age of the patient group was 49.0 years (SD = 12.1; range 22-67). At the time of the study, the subjects were not receiving any psychological treatment.

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* In the advertisement fear of cancer was mentioned as well. This was done because part of the study focussed on this theme.

The control group consisted of 27 healthy subjects (12 male, 15 female) who responded to an advertisement in which the presence of good health was stressed. These subjects were admitted to the experiment after screening for the absence of health problems and health related worries**. Mean age of these subjects was 49.7 years (SD = 12.6; range 21-70). Groups were matched for sex, age and level of education. Sixteen hypochondriacal subjects and four controls were taking medication, either (psycho-)pharmacological or natural products. Groups differed significantly on this matter (χ^2 = 11.4, $p < 0.001$). Psychopharmacological drugs were taken only by hypochondriacs (anti-depressants by one subject; anxiolytics by three subjects). All subjects were right handed. Subjects were paid after participation.

Statistical Methods

T-tests were used to compare mean scores on self-rating measures between hypochondriacal subjects and healthy controls. An ANOVA was used to measure differences in response latencies between hypochondriacs and healthy controls, using anxiety level as a covariate. A Chi-square test was used to test differences in response distributions between the two groups. Significance values were $p = < 0.05$ (two-tailed), unless stated otherwise.

Assessments

Before entering the experiment subjects scored the *Somatosensory Amplification Scale* (SSAS).[4] The SSAS is a self-report questionnaire used to assess perceived sensitivity to mild bodily sensations which are uncomfortable but which are not considered as typical symptoms of serious disease. Upon arrival in the laboratory all subjects rated their level of anxiety on a *visual analogue scale* (VAS; 0 = not anxious at all; 100 = very anxious).

Procedure

Via a finger electrode each subject was connected to an Eltron-D 413 electrical stimulator (*Enraf Nonius, Delft, Holland*) which was invisible to the subject. Subjects were told that during the experiment weak electrical current was going to be supplied in five serial trials, each starting below perceptual threshold with slowly increasing intensity. The instruction was to react as soon as current was felt after which the trial was ended immediately and latency was recorded. If no current was reported the trial was stopped after one minute. In fact no current was supplied.

** We used a screening list asking for the following facts: Do you have any complaints about your health? Do you have an illness which has been diagnosed by your doctor? Are you being treated or have you been treated recently for an illness? Are you concerned about your health? All of these questions had to be answered "No" in order to be considered 'healthy'.

Scoring

Scores were computed in two different ways. First, all 'stimulus detections' were added up leading to an individual score between 0 (no response given) and 5 (response given at each trial). Second, for each trial a 'detection' score was calculated by subtracting response latencies in each trial from the maximum time available per trial (i.e. 60 sec). Total 'detection' score for each subject ranged from 0 (minimal responsiveness) to 300 (maximal responsiveness).

Results

Hypochondriacal subjects scored significantly higher on the SSAS than normal controls ($M=2.91$; $SD=0.81$ vs. $M=2.09$; $SD=0.54$) [$t(52) = 4.44$, $p < 0.001$]. Hypochondriacal subjects also reported more anxiety than controls ($M=2.89$; $SD=2.74$ vs. $M=1.04$; $SD=1.06$) [$t(52) = 3.28$, $p < 0.005$].

In an analysis of variance (ANOVA) we compared total 'detection' scores in both groups using anxiety level (VAS) and somatosensory amplification (SSAS) as covariates. Hypochondriacs less frequently reported current than healthy subjects [$F(1,50) = 20.85$; $p < 0.01$]. This was confirmed in a non-parametric procedure comparing response distribution in both groups [$(\chi^2(1) = 4.75, p < 0.05)$] (see Table 1). Hence, the suggestibility hypothesis was not confirmed.

Table 1. Stimulus 'detection': subject distribution using five trials for each subject

	hypochondriacs (n=27)	controls (n=27)
current reported in at least one trial	10	18
no current reported	17	9

It could be argued that in the hypochondriacal subject group, the tendency to respond to suggestion was blunted or interfered with by the use of medication. The difference in the number of 'stimulus detections' could then be an artefact from the difference in medication use between the two groups. Therefore, we compared the number of 'detections' within the patient group. No differences were found between those subjects using medication (n=16) and those without medication (n=11). Mean response latencies were significantly higher in hypochondriacal subjects than in healthy subjects ($M=281.9$; $SD=30.0$ vs. $M=236.6$; $SD=72.8$) [$t(35) = 2.99$, $p < 0.005$].

Discussion

The study was designed to test if hypochondriacs, relative to normal controls, are more likely to report bodily sensations if the occurrence of sensations is made plausible. Using suggested, but not delivered electrical current, as an independent variable, and reported sensations as a dependent measure, this hypothesis was not confirmed. On the contrary, hypochondriacal subjects were misled *less* easily by the announcement of a forthcoming current.

What could be the reason for this surprising finding? The present study has several limitations. The type of stimulus we used to measure suggestibility may have influenced the results. We announced the *external* administration of non-painful, non-life-threatening electrical current. This may not have had the expected effect on our hypochondriacal subjects who, as a rule, report sensations thought to be caused by *internal* bodily processes and misinterpreted as being a serious health threat. Also, our subjects may have received more control over the experimental situation than hypochondriacal patients do in their natural environment. We gave an explanation in advance about the kind of sensations which might occur, their location, and what would cause them. In real life, hypochondriacal patients fail to find an acceptable explanation for their complaints. It may be worthwhile to study the effects of suggesting a forthcoming internal stimulus ("at the moment many people have got the flu") in both groups. But even if future research would demonstrate high suggestibility in hypochondriacs when it comes to *internal* sensations, this would not explain why the subjects in our study were *hypo*suggestible with regard to the externally 'administered' electrical current.

Results might have been influenced unintentionally by the procedure. Each trial was stopped by the experimenter after one minute, unless the subject reported or showed any reaction. Fifty percent of the subjects did not report any current in each of five trials. The time limit we chose might have prevented some of our subjects from responding at a later moment. But, it still is obscure why, even given this rather short interval, the hypochondriacs were more insensitive than the controls to the suggestion of bodily sensations.

Research has indicated that the awareness and reporting of bodily symptoms is strongly influenced by attentional processes: it has been demonstrated that increased focus of attention to the body heightens symptom reporting.[11-13] In an earlier experiment on symptom reporting in hypochondriacal patients[14] these subjects reported significantly more bodily sensations at a baseline measurement (i.e. without instructions) than a healthy control group. It was concluded, that hypochondriacs are strongly inclined to attend to internal signals even without any request to do so. In the present study the instruction to attend to sensations that might be experienced in the finger solely, may have had less effect in the hypochondriacal group because of interference from existing baseline sensations which could not be suppressed. In other words, the background 'noise' already present in hypochondriacs made the suggestion of a new sensation less powerful.

With respect to the suggestion given in this study, one might speculate that differences in hypnotizability between the two groups may have been an important factor. Although hypnotizability was not measured during this experiment, no

differences as yet have been demonstrated between high and low hypnotizable subjects and ability to concentrate attention accurately on external stimuli.[15] Symptoms reported by subjects are not necessarily the ones perceived. It could be that hypochondriacal subjects are more likely to underreport bodily signals experienced in an experimental setting, in order not to be considered affected. However, it could be that our hypochondriacal subjects were open less to suggestion. It seems our hypochondriacal subjects were not impressed by the message given by an authority, i.e. the experimenter. This impression is in line with the concept of hypochondriasis in which the ineffectivity of medical reassurance possibly caused in part by distrust of physicians' opinion is an important aspect.[5]

As mentioned earlier in the Introduction section, Pauli et al.[8] suggested that high hypochondriacal subjects ignore or do not believe safety signals given by the experimenter. Whereas in our study the suggestion of forthcoming bodily sensations is not 'followed' by the patient group, we suggest that, in clinical practice, this lack of 'suggestibility' causes patients to distrust medical reassurance and to continue worrying and experiencing bodily symptoms.

At present, no studies have investigated the nature of the lack of trust or disbelief of authority by hypochondriacal patients. It may be important whether this represents a domain specific characteristic or a more general characteristic instead. If the latter is true, one may expect hypochondriacs to be in disagreement with authority regarding not only their own health but also regarding additional issues. This 'limited flexibility or rigidity' then may prove to be a personality trait in hypochondriacs, as has been hypothesized.[16] It is unclear if a lack of trust reflects a cause or a consequence of hypochondriasis. Not being easily influenced by others (e.g. doctors), may predispose someone to chronic hypochondriacal problems. On the other hand, those suffering from hypochondriasis may instruct themselves to preferably rely on their own judgement after not having felt reassured by medical professionals about enduring physical sensations. Clarification of these issues may help understand why hypochondriacal patients are so resistant to reassurance.

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Chapter 7

Quantitative and qualitative aspects of cancer knowledge: comparing hypochondriacal subjects and healthy controls

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Accepted for publication in Psychology & Health

Abstract

An exploratory study of cancer knowledge in hypochondriacal subjects (n=27) and matched controls (n=27) is presented. Both quantity and quality of knowledge were investigated; i.e. whether hypochondriacal subjects were better able to discriminate between cancer warning signs and non-warning signs using the Knowledge of Cancer Warnings Signs Inventory (Berman & Wandersman, 1991), than controls. Also, level of cancer knowledge in general was measured using the recently developed Cancer Knowledge Questionnaire (CKQ). Differential effects of threatening versus reassuring information were also studied. Results showed that hypochondriacal subjects were more likely to falsely identify non-warning signs as cancer warning signs than control subjects. Groups did not differ in general level of cancer knowledge. High health anxiety subjects agreed with threatening statements more often than non-hypochondriacal subjects. Hypochondriacal subjects' general coping style was characterized by more information seeking and less information avoiding. Implications of these results are discussed.

Introduction

Hypochondriacal subjects are characterized by an extreme preoccupation with their own health status in absence of organic pathology or with insufficient organic pathology to justify anxiety. Despite medical reassurance these subjects are convinced they are ill or afraid of becoming ill, based on misinterpretation of physical signs or sensations as evidence of physical illness (APA, 1994).

Little is known about the factual knowledge hypochondriacal subjects have about serious diseases. For instance, what do hypochondriacal subjects with cancer fears actually *know* about the illness? Selective attention to cancer related information may be accompanied by deeper processing of the information, resulting in relatively high level of knowledge. Yet attentional research in anxiety has found no evidence for better retrieval of stimuli that are selectively attended to (Beck, Stanley, Averill, Baldwin & Deagle, 1992; Mathews & MacLeod, 1985; Mogg, Mathews & Weinman, 1989). Alternatively, the cognitive processes in high health anxiety subjects confronted with facts about cancer may be limited to the early stages of information processing, after which no elaboration takes place. Given that perception of related cues provokes anxiety, selective attention may be followed by cognitive avoidance of the information, resulting in relatively poor knowledge retention (Mathews & Eysenck, 1987; Mathews, Mogg, May & Eysenck, 1989; Mogg, Mathews & Weinman, 1987).

Coping theories may help to clarify this issue. Studies concentrating on the way people deal with information about threatening events revealed two different coping styles: monitoring (information seeking) and blunting (avoiding information) (Miller, 1987). The inclination to perceive possibly aversive situations as threatening is known to be associated with a monitoring coping style (Muris & De Jong, 1993). Given that some hypochondriacal subjects fear (or believe they have) cancer, one might expect them to habitually monitor the subject, resulting in a relatively high level of knowledge. Investigating the influence of anxiety on cancer knowledge, Steptoe, Sutcliffe, Allen and Coombes (1991) indeed found that factual knowledge about cancer was positively correlated with trait anxiety level. Other authors, however, claim that a person's cancer knowledge level is negatively influenced by fear of cancer (Berman & Wandersman, 1991; Gutteling, Seydel & Wiegman, 1986; Jepson & Chaiken, 1990).

In addition to the options mentioned earlier (hypochondriacal subjects know either more or less), comparing factual knowledge about cancer in hypochondriacal subjects and healthy controls may indicate no mean difference if knowledge about cancer is bimodally distributed in hypochondriacal subjects - some individuals knowing very much while others know very little - whereas in healthy controls it is normally distributed.

Finally, patient-control differences might not be found primarily in the *quantity* of cancer knowledge but in the *quality* of the accessible knowledge instead. People in general tend to preferentially perceive and process information that is consistent with prior beliefs, ignoring contradictory information (Gorman, 1986; Levine, 1966). As hypochondriacal subjects tend fundamentally to believe that they are vulnerable to serious medical disorders, they are expected to attend selectively to information which appears to confirm the idea of having an illness, while

selectively ignoring evidence indicating good health (Salkovskis, 1989; Salkovskis & Clark, 1993; Warwick & Salkovskis, 1989; 1990). As a result of this confirmation bias, these subjects' knowledge base is expected to contain much more negatively valued (i.e. threatening) aspects as opposed to positively valued (i.e. reassuring) aspects.
Cancer knowledge quality in hypochondriacal subjects may also be influenced by negative affectivity, which is apparent, for example, from elevated scores on trait anxiety (Haenen, Schmidt, Kroeze & Van den Hout, 1996), neuroticism (Byrne, 1975) and negative mood (Barsky, Wyshak & Klerman, 1992; Kellner, Slocumb & Wiggins, 1987; Noyes, Kathol, Fisher, Phillips, Suelzer & Woodman, 1994). As subjects high in negative affectivity are more likely to interpret ambiguous stimuli in a negative or threatening manner (Watson & Clark, 1984), in hypochondriacal subjects this characteristic may become apparent through endorsing negative items, irrespective of functional knowledge. In other words, hypochondriacal subjects will be inclined to agree more with statements that have a threatening content and to disagree more with statements that have a reassuring content, regardless of the facts.

The aim of the present study was to test the following hypotheses:
Hypothesis 1. Relative to healthy controls, hypochondriacal subjects know more about cancer in terms of general level of knowledge as well as in terms of recognition and interpretation or misinterpretation of cancer warning signs.
Hypothesis 2. Relative to healthy controls, hypochondriacal subjects know more about threatening aspects of cancer and less about reassuring aspects of cancer.
Hypothesis 3. Relative to healthy controls, hypochondriacal subjects more often agree with threatening statements about cancer and disagree with reassuring statements, irrespective of the statements' correctness.

Method

Subjects

Twenty-seven subjects (12 male, 15 female) with hypochondriasis, according to the criteria of DSM-III-R (APA, 1987), participated in the study. Hypochondriacal subjects were selected via an advertisement in a local newspaper in which some characteristics of hypochondriasis were mentioned (complaints, anxiety or disease conviction, anxiety remaining despite medical reassurance) as well as fear of cancer. Fifty-one subjects responded to the advertisement. A first selection was done by telephone, thereby reducing the group of subjects to those who might possibly fulfil the criteria (as would later be determined in the interview). Of these, 27 subjects were admitted to the hypochondriacal group because they fulfilled all DSM-III-R diagnostic criteria as was determined by the first author using the Structured Diagnostic Interview for Hypochondriasis (SDIH) (Barsky, Cleary, Wyshak, Spitzer, Williams & Klerman, 1992) and because fear of cancer was (one of) their major health concern(s). Mean age of the hypochondriacal group was 49.0 years (SD=12.1; range 22-67). Duration of health anxiety ranged from six months to eighteen years. At the time of the study, the subjects were

not receiving any psychological treatment.
The control group consisted of 27 healthy subjects (12 male, 15 female) who reacted to an advertisement in a local newspaper in which the presence of good health was stressed. In order to screen for the absence of health problems and health related worries, we used a simple screening list asking for the following facts: *Do you have any complaints about your health? Do you have an illness which has been diagnosed by your doctor? Are you being treated or have you been treated recently for an illness? Are you concerned about your health?* All of these questions had to be answered "No" in order for the subject to be considered healthy. Mean age of the subjects was 49.7 years (SD= 12.6; range 21-70). Groups were matched for sex, age and level of education. Sixteen hypochondriacal subjects and four controls were taking medication, either (psycho-)pharmacological or "recreational" drugs. Groups differed significantly on this variable [$\chi^2(1) = 11.4$, $p < 0.001$]. Subjects were paid after participation.

Assessments
VAS. Upon arrival in the laboratory subjects rated their level of anxiety on a visual analogue scale (VAS; 0=not anxious at all; 100=extremely anxious). This was done in order to allow state anxiety effects on completing the questionnaires to be examined.
Chronic Fear of Cancer (CFC; Jepson & Chaiken, 1990). This questionnaire was used so as to measure chronic fear of cancer. This was done by averaging subjects' responses to four questions concerning chronic fear and perceived severity of cancer on a 10-point scale.
Miller Behavioural Style Scale (MBSS; Miller, 1987). In this questionnaire subjects are requested to rate their inclination to seek out or avoid information about threatening uncontrollable events. The scale was used in order to detect possible correlations between level of knowledge and coping style. It consists of four hypothetical stress-evoking scenarios, each of which is followed by eight coping options. Four options represent information seeking or 'monitoring', whereas the other four are avoidant or 'blunting' options. Three scores can be derived from the MBSS: a total monitoring score, a total blunting score, and a summary score calculated by subtracting blunting from monitoring sum scores. The 5-point version (Van Zuuren & Wolfs, 1991) asks subjects to indicate to what extent each option is applicable (1=not applicable at all, 5=very much applicable; range for each subscale: 16-80). This version has fair internal consistency (Cronbach's alpha was 0.79 on the monitoring subscale and 0.69 on the blunting subscale) and its factor structure is satisfactory (a clear two-factor solution was found).
The following two questionnaires were used to test the hypotheses:
Knowledge of Cancer Warnings Signs Inventory (KCWSI; Berman & Wandersman, 1991). In order to measure level of knowledge about cancer warning signals (first hypothesis) the KCWSI was administered. This self-report questionnaire consists of 25 symptoms to be rated on a four-point continuum to indicate the likelihood of each symptom as a warning sign of cancer (0=not a warning sign, 3= definitely a warning sign). Seven of the 25 symptoms are the actual warning signs, while the remaining 18 are non-warning signs of distress selected from

SCL-90-R subscales (Derogatis, 1983). Three scores are derived directly from the KCWSI, each on continuous interval scales. These are Basic Recognition of Cancer Warning Signs (BRCWS) (scores ranging from 0 to 21), Non-warning Signs Perceived as Warning Signs (NSPWS) (scores ranging from 0 to 54), and Accurate Knowledge of Cancer (AKC). On the AKC scores can range from -21 to 21, with high scores indicating good recognition of the seven warning signs and minimal misperception of non-warning signs as cancer symptoms.

Cancer Knowledge Questionnaire (CKQ). Based on information brochures provided by the Dutch cancer foundation (Stichting Koningin Wilhelmina Fonds, Netherlands Cancer Foundation), we composed a 98-item questionnaire covering general aspects, prevention, risk factors and treatments of cancer. In a pilot study (*unpublished data*) we administered the first version of the questionnaire to 51 randomly selected healthy adults. Questions that were answered correctly by less than 60 percent of the respondents remained in the questionnaire; the other items were dropped. This was done to prevent ceiling effects in this study and also in future learning effect measurements. It resulted in a 64-item questionnaire containing general, prevention and cure items as well as concentration check dummies. Subsequently the questionnaire was administered to eight general practitioners who filled in the questionnaire. After that a cancer expert decided about the items that did not reach 80 percent agreement among general practitioners. The final version of the questionnaire consisted of 49 items (18 general items, 14 prevention and risk factor items, 17 cure items) and 5 concentration check dummies (four of which had to be answered correctly in order to enter data analyses). Answering categories were "true", "false" and "?". To correct for chance effects, total knowledge scores were computed by subtracting the number of false answers from the number of right answers. Theoretically, total scores range from -49 to 49.

In order to measure CKQ internal consistency the list was completed by 81 undergraduate students: 40 medical (17 male, 23 female) and 41 non-medical (23 male, 18 female). The groups did not differ with respect to sex ratio [$\chi^2(1) = 1.50$, $p = 0.22$] and age ($M=23.6$; $SD=2.4$ vs $M=23.5$; $SD=2.8$) [$t(76) = 0.22$, $p = 0.83$]. Cronbach's alpha was found to be acceptable ($\alpha = 0.77$), indicating that the questionnaire measures an internally consistent construct. Item deletion did not increase reliability. Total knowledge scores were higher in medical students [$t(79) = 13.7$, $p < 0.001$]. Comparing subgroups within the medical students group, those who were still in their preclinical years had significantly lower knowledge scores than those who were already in their clinical years [$t(33) = -1.80$, $p < 0.05$]. Based on agreement percentage of at least 80 percent, a university staff panel of 15 people then categorized 14 items as 'threatening' and 10 items as 'reassuring'. The remaining 25 items were considered to be 'neutral'. The CKQ was used in testing all three hypotheses.

Procedure

Subjects were asked to complete the visual analogue scale measuring state anxiety. Subsequently, MBSS, CFC, KCWSI and CKQ were filled in.

Results

Mean anxiety (VAS) when entering the experiment was significantly higher in hypochondriacal subjects, mean scores being 3.6 (SD=2.6) vs 1.4 (SD=1.6) in the control group [$t(51) = 3.68$, $p < 0.005$]. Chronic fear of cancer (CFC) was also significantly higher in the hypochondriacal group (M=34.4; SD=4.3 vs M=18.1; SD=6.9) [$t(52) = 10.46$, $p < 0.001$]. Further data analyses (ANOVA) revealed significant differences in general coping styles as measured with the MBSS, hypochondriacal subjects displaying more monitoring (M=61.4; SD=9.2 vs M=50.8; SD=9.5) ($F(1,52) = 17.48$; $p < 0.001$) and less blunting (M=41.6; SD=9.5 vs M=46.7; SD=8.7) ($F(1,52) = 4.25$; $p < 0.05$).

Accurate knowledge of cancer warning signs (AKC) as measured by the KCWSI revealed no differences between mean scores in the hypochondriacal group and the control group (M=9.4; SD=4.3 vs M=8.0; SD=3.1) ($F(1,52) = 1.89$; n.s.). Non-parametric tests (Kolmogorov-Smirnov Goodness of Fit) showed that the level of knowledge was normally distributed in both groups, ruling out bimodal distribution in the hypochondriacal group as an explanation for absent mean differences in cancer knowledge between the two groups. On further exploration it appeared that hypochondriacal subjects scored higher on recognition of warning signs (BRCWS) (M=13.6; SD=3.2 vs M=9.9; SD=3.4) ($F(1,52) = 16.70$; $p < 0.001$) as well as on misinterpretation of non-warning signs (NSPWS) (M=10.7; SD=8.0 vs M=4.9; SD=4.7) ($F(1,52) = 10.63$; $p < 0.005$).

Concentration check scores revealed that all subjects were sufficiently concentrated while completing the CKQ questionnaire measuring cancer knowledge. CKQ mean scores between subjects and controls did not differ significantly (M=7.0; SD=8.1 and M=5.6; SD=8.3 respectively) ($F(1,52) = 0.54$; n.s.).

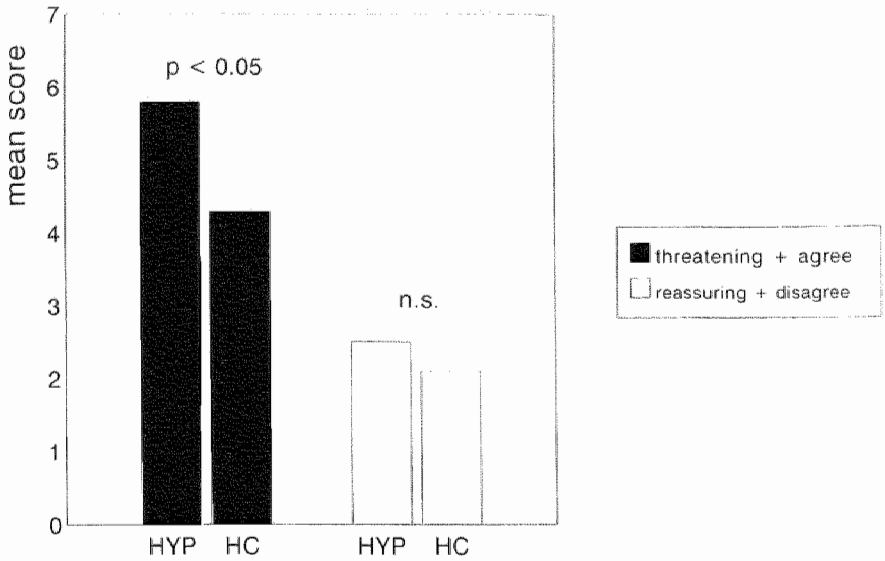
These results are not consistent with the hypothesis that, in terms of general level of knowledge, hypochondriacal subjects know more about cancer than normal controls. Even though subjects identified a higher proportion of cancer warning signals, they also wrongly mistook non-warning signs for warning signs.

CKQ results showed that hypochondriacal subjects knew as much about threatening aspects of cancer as healthy controls (M=1.8; SD=2.3 vs M=1.9; SD=2.3) ($F(1,52) = 0.002$; n.s.). Comparable results were found concerning reassuring aspects of cancer (M=1.6; SD=2.6 vs M=0.8; SD=2.8) ($F(1,52) = 1.34$; n.s.). Thus, no evidence was found to support the hypothesis that hypochondriacal subjects know more about threatening aspects of cancer and less about reassuring aspects of cancer than healthy controls do.

Focussing on CKQ response tendencies, it appeared that hypochondriacal subjects agreed with threatening cancer statements more often than healthy controls (M=5.8; SD=2.3 vs M=4.3; SD=2.3) ($F(1,52) = 6.26$; $p < 0.05$). Further analysis revealed that these response differences reflected the hypochondriacal subjects' inclination to wrongly agree with false statements. As far as disagreement with reassuring statements was concerned, group response tendencies did not differ, irrespective of whether the statement fitted the facts.

As is shown in Figure 1, these results support the hypothesis that hypochondriacal subjects agree with threatening statements about cancer more often than healthy controls do. Both groups, however, appear equally inclined to disagree with reassuring statements.

Figure 1. Responses to threatening and reassuring cancer items. Comparing hypochondriacal subjects (HYP) (n = 27) and healthy controls (n = 27)



The Cancer Knowledge Questionnaire used to measure response tendencies contains 14 threatening items (7 true, 7 false; score range 0-14) and 10 reassuring items (6 true, 4 false; score range 0-10)

Discussion

The present study led to four main findings.

First, hypochondriacal subjects' level of knowledge about cancer does *not* differ from that found in non-hypochondriacal subjects, as is apparent from scores on KCWSI and CKQ. However, it was demonstrated that hypochondriacal subjects consider a broader range of innocuous bodily signals to be cancer related, leading to overinclusion (high false positive identification) of cancer warning signs.

Second, hypochondriacal subjects know as much about threatening and reassuring aspects of cancer as healthy controls do. In other words, we found no indications for an attentional preference of or a deeper processing of negative information about cancer in hypochondriacal subjects.

Third, hypochondriacal subjects agree with threatening statements more often than non-hypochondriacal subjects, irrespective of the correctness of the answer. Although together with this response pattern heightened disagreement with

reassuring statements was expected, this was not found. Thus, it seems that hypochondriacal subjects' opinion about cancer messages only differs from that found in healthy controls as far as negatively valenced (threatening) messages about the disease are concerned.

Fourth, when confronted with alarming uncontrollable events, hypochondriacal subjects show a higher general tendency to seek information (monitor) and a lower tendency to avoid information (blunt) as compared to healthy subjects. This might imply that, whenever these subjects encounter cancer related information, the same strategy is being used.

Contrary to our expectation, hypochondriacal subjects did not know more about cancer in general than healthy controls. This seems to be inconsistent with the results found by Katz, Meyers and Walls (1995), studying cancer awareness and self-examination practices in young men and women. The authors found fear of developing cancer (perceived susceptibility) to be one of the best predictors of cancer knowledge. However, these were healthy, non-hypochondriacal subjects who may cope with health threats in a different, more competent way than hypochondriacal subjects do.

The fact that high health anxiety subjects in our study regarded more harmless bodily symptoms to be cancer related is in line with the cognitive-behavioural hypothesis regarding a negative interpretation of bodily signs and symptoms to be one of the core features of hypochondriasis (Warwick & Salkovskis, 1989). In agreement with this, Barsky uses the concept of somatosensory amplification, one of its elements being the tendency to appraise visceral and somatic sensations as symptomatic of disease, rather than perceiving them as normal (Barsky, 1992; Barsky, Coeytaux, Sarnie & Cleary, 1993; Barsky, Wyshak & Klerman, 1990). According to Salkovskis and Clark (1993), hypochondriacal subjects show a more generalized tendency to fear both anxiety related and anxiety unrelated symptoms, which are misinterpreted as indicators of catastrophic illness with an insidious course.

Although hypochondriacal subjects agreed with threatening statements more often than healthy controls, in this study they knew as much about threatening aspects of cancer and about reassuring aspects of cancer as healthy controls did. This is surprising, since high health anxious subjects are known to selectively expose themselves to threatening information (Salkovskis & Clark, 1993). In our study a general monitoring coping style appeared to characterize hypochondriacal subjects, while blunting was reported less frequently by these subjects than by healthy controls. The MBSS is a questionnaire supposedly predicting the individual's dispositional tendency to seek information in response to physical and/or psychological stressors of an uncontrollable nature (Miller, 1990; 1992). Supposing that the same coping strategy is activated when confronted with cancer information, in hypochondriacal subjects the negative (i.e. alarming and uncontrollable) aspects of the disease would get more attention. From the literature it is clear that hypochondriacal subjects manifest excessive attention to bodily sensations and constantly monitor their own bodily status (Kellner, Abbott, Winslow & Pathak, 1987; Warwick & Salkovskis, 1989). It is also likely that attention to a symptom amplifies it, whereas distractions diminish it (Barsky, 1992). In line with the low

inclination to blunt found in high health anxious subjects, Kellner et al. (1987a) found that hypochondriacal subjects were less able to distract themselves when they feel bodily symptoms. However, the results from our study indicate that this may be a more general style of dealing with threatening information.

Some possible methodological limitations of this study should be discussed. It may be questioned why such a relatively large proportion of our media-recruited volunteers appeared to fulfill DSM-III-R criteria for hypochondriasis. In order to recruit and select hypochondriacal subjects most efficiently, we put an advertisement clearly describing hypochondriasis (see Method) in a local newspaper read by many people. The diagnostic instrument we then administered for selection purposes was shown by Barsky et al. (1992a) to have good reliability and validity, indicating that our subjects were meeting diagnostic criteria for hypochondriasis. Another point here is that the procedure might have introduced a selection bias, possibly influencing the results. Our hypochondriacal subjects were selected via a newspaper advertisement, instead of from health care sources. It is possible that the present sample differed from clinical health anxiety subjects in that they were focussing more on reassurance and/or somatic explanations for their complaints, and less willing to consider psychological aspects of their behaviour. Also, cancer knowledge levels in our hypochondriacal group may not be representative of hypochondriacal subjects in general, as fear of cancer was one of the selection criteria.

In the present study the hypochondriacal group reported significantly higher anxiety levels when entering the experiment. An elevated level of general anxiety might explain the tendency of the health anxious subjects to agree with threatening statements more than the non-health anxious subjects. That is, the result obtained concerning threatening statements may not be due to health anxiety but may be a result of increased levels of general anxiety. This could be dealt with by including a control group (e.g. socially anxious patients or high trait anxious volunteers) who are equally anxious but not worried about their health. Also, it remains unclear whether health related messages, judged to be reassuring or threatening by healthy volunteers, would have had the same emotional value according to hypochondriacal subjects.

Some remarks are in order as to the implications of the current data. The present study shows that neither the quantity nor the quality of cancer knowledge in hypochondriacal subjects differs from that found in healthy controls. However, groups differ in the way cancer information is being dealt with: hypochondriacal subjects consider more innocent bodily symptoms to be cancer related and more threatening cancer statements to be true. It seems, therefore, to be all-important to them not to overlook any danger regarding the topic.

As a monitoring coping style appears not to lead to higher cancer knowledge levels in hypochondriasis, it seems that, despite repeatedly exposing themselves to threatening information, hypochondriacal subjects only superficially process and integrate the messages. It remains unclear however, what cancer information, if any, these subjects had been confronted with in the past. In future research it may be worthwhile to experimentally study effects of education about serious illnesses on hypochondriacal subjects.

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Chapter 8

Presenting a cancer education video to hypochondriacal and healthy subjects

Effects on level of knowledge, perceived threat and safety, and symptom reporting

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Submitted for publication

Abstract

An experimental study was performed to explore the effect of presenting information about cancer to hypochondriacal subjects (n=27) and healthy controls (n=27). After an initial cancer knowledge measurement (Haenen et al., in press) subjects were shown a twenty-minute video in which information about cancer was provided. Based on the cognitive-behavioural theory of hypochondriasis (Warwick & Salkovskis, 1989), it was hypothesized that after watching the video, hypochondriacal subjects would show relatively less cancer knowledge increase, more increase in agreeing with threat and in disagreeing with safety, and more increase in the reporting of bodily symptoms. Post-test results revealed that in both groups cancer knowledge had increased significantly and to the same extent. Whereas initially the hypochondriacal group more often agreed with threatening statements than healthy controls, in the post-test groups no longer differed in this respect. As for the inclination to disagree with safety, groups did not differ in the pre-test, and were equally inclined to disagree with safety more often after having seen the cancer video. Finally, pre-test symptom reporting being significantly higher in hypochondriacal subjects, both groups showed a similar significant decrease in symptom reporting in the post-test. A one-year follow-up study showed that both groups still knew more about cancer than prior to the video. Both groups less often agreed with threatening statements than in the post-test, although healthy controls' level still remained higher than in the pre-test. As for safety disagreement, both groups showed a similar decrease as compared to post-test levels. Pre-test and follow-up levels did not differ. The implications of these results for educating hypochondriacal and healthy subjects are discussed.

Introduction

It remains unclear why hypochondriacal patients, in spite of all the effort of medical professionals to provide reassurance, remain preoccupied with the fear of having a serious disease or the conviction of being seriously ill (APA, 1994). These patients clearly demonstrate a strong resistance to modify their ideas about their personal vulnerability to illness. How should hypochondriacal patients' reluctance to give up illness convictions in the light of disconfirming evidence, be explained? Describing the disorder from a cognitive-behavioural perspective, Warwick and Salkovskis (1989) state that hypochondriacal subjects are characterized by some highly specific ways to process information related to health serious diseases. According to their model, hypochondriacs attend to negative information, discount positive information, and interpret and recall information in an illness confirming and health disconfirming way (Salkovskis, 1989; Salkovskis & Warwick, 1986). In doing so, these patients most likely do not benefit from health education as much as healthy subjects do, appearing from less growth of factual knowledge and from a tendency to wrongly agree with threat and disagree with safety. In addition, the heightened perception of threat in hypochondriacal subjects is said to increase physiological arousal, promoting the reporting of bodily symptoms.

The present study started from the cognitive-behavioural model in order to investigate experimentally various effects of cancer education in hypochondriasis. A twenty-minute video tape was developed presenting facts about different aspects of the disease. Three aspects of response to the cancer information video were investigated. First, (increase in) level of knowledge after watching the video was examined. Second, perceived threat and safety following the video were studied, as indicated by agreement with threatening cancer statements and disagreement with reassuring (safety) cancer statements. Third, the effect of watching the video on the reporting of bodily sensations was explored. In accordance with the cognitive-behavioural model the following hypotheses were tested:

Hypothesis 1. Hypochondriacal subjects will, relative to healthy controls, show less increase in level of cancer knowledge when provided with cancer information;

Hypothesis 2. Hypochondriacal subjects will, relative to healthy controls, show more increase in agreeing with threat and in disagreeing with safety when provided with cancer information;

Hypothesis 3. Hypochondriacal subjects will, relative to healthy controls, show more increase in the reporting of bodily symptoms when provided with cancer information.

As it might well be that results are influenced by the subjects' state anxiety and their coping style, as well as by their concentration while watching the video and by the videos emotional impact, these variables were also taken into account in the measurements.

Method

Subjects

Twenty-seven subjects (12 male, 15 female) with DSM-III-R hypochondriasis (APA, 1987) participated in the study. Hypochondriacal subjects were selected via an advertisement in a local newspaper mentioning some characteristics of hypochondriasis (complaints, anxiety or disease conviction, anxiety remaining despite medical reassurance) as well as fear of cancer. Fifty-one subjects responded. A first selection was done by telephone, thereby reducing the group of subjects to those who might possibly fulfill the criteria (as would later be determined). Prior to the experiment, 27 subjects were admitted to the hypochondriasis group because they fulfilled all DSM-III-R diagnostic criteria as was determined in a face-to-face interview by the first author using the Structured Diagnostic Interview for Hypochondriasis (SDIH) (Barsky, Cleary, Wyshak, Spitzer, Williams & Klerman, 1992). Mean age of the hypochondriacal group was 49.0 years (SD= 12.1; range 22-67). Duration of health anxiety ranged from six months to eighteen years. At the time of the study, the hypochondriacal subjects were not receiving any psychological treatment.

The control group consisted of 27 healthy subjects (12 male, 15 female) out of about 150 who reacted to an advertisement in a local newspaper stressing the presence of good health. Those who were selected, exactly matched for sex, age and level of education with of one the hypochondriacal subjects. A simple screening list was used to check the absence of health problems and health-related worries. The following facts were asked for: *Do you have any complaints about your health? Do you have an illness which has been diagnosed by your doctor? Are you being treated or have you been treated recently for an illness? Are you concerned about your health?* Those subjects who answered "No" to all of these questions were considered healthy. Mean age of the subjects was 49.7 years (SD= 12.6; range 21-70). Sixteen hypochondriacal subjects and four controls were taking medication, either (psycho-)pharmacological or homeopathic drugs. Groups differed significantly on this variable [$\chi^2(1) = 11.4$, $p < 0.001$]. All subjects were paid after participation. At the one-year follow-up, all hypochondriacal subjects still fulfilled DSM-III-R diagnostic criteria for hypochondriasis, and none of the controls did. Four hypochondriacal and one control subject did not return the follow-up questionnaire. Hypochondriacal drop-outs did not differ from other hypochondriacal subjects in Chronic Fear of Cancer score, state anxiety and general symptom reporting before and after watching the video, nor from level of cancer knowledge before watching the video as measured by the CKQ. However, hypochondriacal follow-up drop-outs had lower cancer knowledge scores after watching the video [$t(12) = 2.41$, $p < 0.05$] compared to those who participated.

Assessments

Visual Analogue Scales (VASs) were used to measure state anxiety when entering the experiment and both before and after watching the video. Concentration while watching the video was scored on a VAS afterwards, scores ranging between 0 (not concentrated at all) and 100 (extremely concentrated). Also two VAS judgements about the video were asked for: "How do you judge the infor-

mative value of the video?" (0=not informative at all ; 100=extremely informative) and "What is your opinion about the video?" (0=extremely threatening; 100= extremely reassuring).

A 47-item *symptom checklist* was used, referring to physical sensations in different parts of the body. Items were scored on a 5-point scale, ranging from '0' (absent) to '4' (very strongly present). Based on a previous study (Haenen, Schmidt, Kroeze & Van den Hout, 1996) the symptoms mentioned can be classified as either 'hypochondriasis relevant' (15 items judged to be more frightening by hypochondriacal subjects, e.g. feeling restless or tense) or 'hypochondriasis non-relevant' (32 items considered equally frightening by hypochondriacal subjects and healthy controls, e.g. being hungry).

In the *Miller Behavioural Style Scale (MBSS; Miller, 1987)* questionnaire subjects are requested to rate their inclination to seek out or avoid information about threatening uncontrollable events. The 5-point version (Van Zuuren & Wolfs, 1991) consists of four hypothetical stress-evoking scenarios, each of which is followed by four information seeking or 'monitoring' coping options and four avoidant or 'blunting' options. Subjects indicate to what extent each option is applicable (1=not applicable at all, 5=very much applicable; range for each subscale: 16-80). Three scores can be derived from the MBSS: a total monitoring score, a total blunting score, and a summary score calculated by subtracting blunting from monitoring sum scores.

The *Chronic Fear of Cancer (CFC; Jepson & Chaiken, 1990)* questionnaire was used to measure chronic fear of cancer by averaging subjects' responses to four questions concerning chronic fear and perceived severity of cancer on a 10-point scale. Information about test-retest reliability of the questionnaire is not available.

The *Cancer Knowledge Questionnaire (CKQ)* is a 54-item questionnaire based on information brochures provided by the Dutch cancer foundation. It covers general aspects (18), prevention and risk factors (14) and treatments of cancer (17) and has five concentration check dummies which serve to control for loss of attention (e.g.: "Smoking increases the risk of getting cancer"). Answering categories were "true", "false" and "?". To correct for chance effects, total knowledge scores were computed by subtracting the number of false answers from the number of correct answers. Theoretically, total scores ranged from -49 to 49. Based on agreement percentage of at least 80 percent, a university staff panel of 15 people had previously categorized 14 items as 'threatening' and 10 items as 'reassuring'. The remaining 25 items were considered to be 'neutral'. More background information about the development and the qualities of this questionnaire is described elsewhere (Haenen et al., *in press*).

Procedure

After entering the laboratory, subjects completed the visual analogue scale measuring state anxiety. They then reported perceived bodily symptoms on the symptom checklist, after which CFC, CKQ, an inventory measuring knowledge of cancer warning signs (results described elsewhere; Haenen et al., *in press*) and MBSS were completed. Subjects were seated in a comfortable chair that was

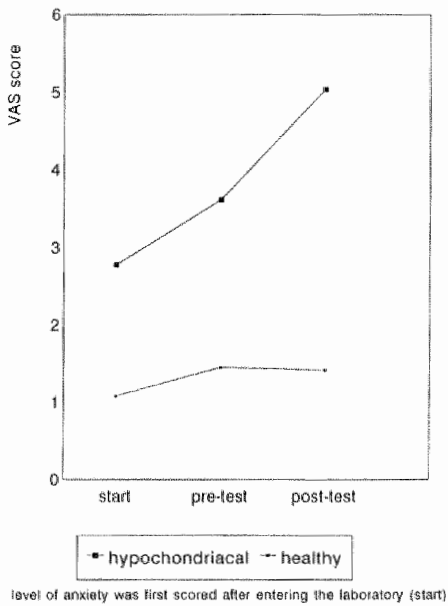
placed in a sound-attenuated room. Thirty minutes after filling in the CKQ subjects were told that they were going to see a video tape about cancer which they would later be asked to judge. A second state anxiety VAS was then completed. Subsequently, subjects were shown a twenty-minute video tape in which information was given about general aspects of cancer, cancer prevention, cancer risk factors and different cancer treatments. The video covered the same themes that are presented in the CKQ. It showed an actress reading a text in a way comparable to a news reader. After having watched the video, subjects completed three VASs, asking for state anxiety, concentration during watching the video and video judgement. During the next thirty minutes the post-test symptom reporting questionnaire and a filler questionnaire (i.e. an experimental coping strategy list) were administered. After that, subjects filled in the CKQ once more. Cancer knowledge and perceived threat and safety as measured by the CKQ were assessed again in a one-year follow-up study.

Results

Descriptive measures

Mean anxiety scores (VAS) for both groups are presented in Figure 1.

Figure 1. Anxiety level before and after watching a cancer video



At the start, anxiety levels were significantly higher in hypochondriacal subjects than in controls (M=2.8; vs M=1.1) [$t(52) = 3.66$, $p < 0.005$]. Comparing anxiety levels before and after the video presentation, a 2 Group (hypochondriacal / control) x 2 Time (pre-test / post-test) ANOVA showed a significant effect of

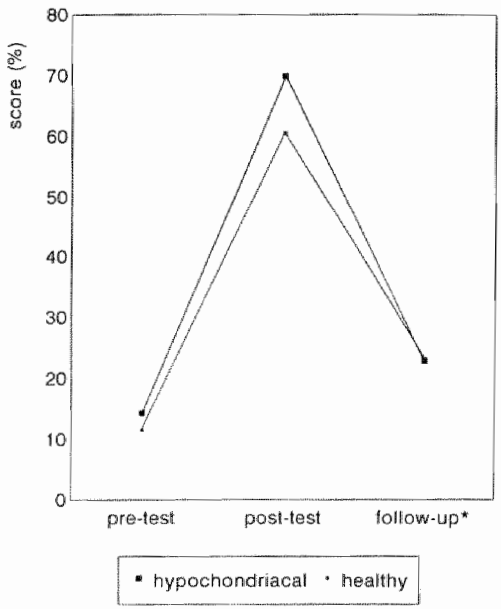
Group ($F(1,51) = 27.38$; $p < 0.001$), which refers to the finding that hypochondriacal subjects were more anxious than controls. There was a significant effect Time ($F(1,51) = 7.87$; $p < 0.01$), indicating that watching the tape caused an anxiety increase. A significant interaction was found between Group and Time ($F(1,51) = 8.67$; $p < 0.01$), implying, as is shown in Figure 1, that only hypochondriacs were affected is this way.

General coping styles, as measured by the MBSS, differed significantly. Hypochondriacal subjects reported more monitoring ($M=61.4$; $SD=9.2$ vs $M=50.8$; $SD=9.5$) ($F(1,52) = 17.48$; $p < 0.001$) and less blunting ($M=41.6$; $SD=9.5$ vs $M=46.7$; $SD=8.7$) ($F(1,52) = 4.25$; $p < 0.05$). As could be expected, chronic fear of cancer scores as measured by the CFC were significantly higher in the hypochondriasis group ($M=34.4$; $SD=4.3$ vs $M=18.1$; $SD=6.9$) [$t(52) = 10.46$, $p < 0.001$]. Subjective concentration while watching the video (VAS) and judgement of the videos' informative value (VAS) revealed no differences between groups. The hypochondriacal group, however, considered the video to be more threatening (VAS) than healthy controls ($M=5.2$; $SD=2.7$ vs $M=7.5$; $SD=1.9$) [$t(52) = 3.58$, $p < 0.005$]. CKQ concentration check scores revealed that all subjects were sufficiently concentrated while filling in the CKQ, during both pre- and post-measurement.

Level of knowledge

Mean levels of cancer knowledge are presented in Figure 2.

Figure 2. Level of knowledge in pre-test, post-test and follow-up



comparing pre-test and follow-up measurement revealed significant learning effects for hypochondriacal subjects ($p = 0.015$) and healthy controls ($p = 0.001$)

* only 23 hypochondriacal subjects and 26 healthy controls participated in the follow-up

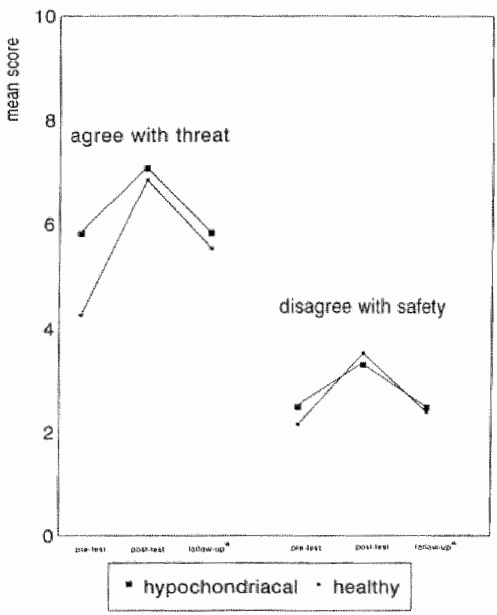
A 2 Group (hypochondriacal / control) x 2 Time (pre-test / post-test) ANOVA revealed no main effect of Group [$F(1,52) = 0.15$], implying that, overall, there was no difference in cancer knowledge level between groups. There was a significant effect of Time $F(1,52) = 694.34$, $P < 0.001$). Figure 2 shows that participants' knowledge levels were relatively low before, and relatively high soon after watching the video. There was no interaction between Group and Time [$F(1,52) = 0.10$], hence no evidence emerged to suggest that this knowledge pattern differed between groups.

Although one year after the video presentation knowledge levels had decreased dramatically, they were still higher than before watching the video in the hypochondriacal group [$t(23) = 4.05$, $p < 0.005$] as well as in controls [$t(26) = 4.25$, $p < 0.001$]. Additional analyses revealed that cancer knowledge increase was not related to general coping styles.

Perceived threat and safety

With regard to agreeing with threat before and after the video presentation, a 2 Group (hypochondriacal / control) x 2 Time (pre-test / post-test) ANOVA revealed a significant effect of Group ($F(1,52) = 5.07$; $p < 0.05$), as well as an effect of Time ($F(1,52) = 35.22$; $p < 0.001$). As can be seen in Figure 3, this reflects the finding that, although hypochondriacal subjects habitually agreed with threat more often, both groups showed an increase in threat agreement after watching the video.

Figure 3. Perceived threat and safety in pre-test, post-test and follow-up



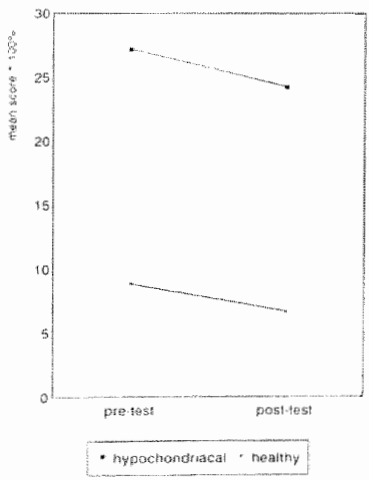
The Cancer Knowledge Questionnaire used to measure perceived threat and safety contains 14 threat items (7 true, 7 false; score range 0-14) and 10 safety items (6 true, 4 false; score range 0-10)
* only 23 hypochondriacs and 26 healthy controls participated in the follow-up

Also, an interaction effect was found between Group and Time ($F(1,52) = 4.22$; $p < 0.05$), reflecting the fact that the change in threat agreement was less obvious in hypochondriacal subjects than in healthy controls. As is apparent from Figure 3, this cannot be accounted for by ceiling effects in the hypochondriacal group. With regard to disagreeing with safety, a 2 Group (hypochondriacal control) x 2 Time (pre-test / post-test) ANOVA showed an effect of Time ($F(1,52) = 15.49$; $p < 0.001$), no effect of Group and no interaction between Group and Time. Both groups tended to disagree with safety more often after having seen the video. As for the follow-up, a significant effect of Time was found, with both groups showing a decrease in the tendency to agree with threat as compared to the post-test ($F(1,52) = 21.95$; $p < 0.001$). In addition, a significant interaction between Group and Time emerged ($F(1,52) = 5.69$; $p < 0.05$), as only in the control group an increase in threat agreement was found as compared to pre-test scores. Comparing the inclination to disagree with safety in the post-test and the follow-up revealed a significant effect of Time ($F(1,52) = 16.36$; $p < 0.001$). Both groups showed a similar decrease regarding this issue. No effects were found analysing pre-test scores versus follow-up scores on this matter.

Reporting of bodily signals

Comparing symptom reporting total scores as measured by the symptom checklist before and after the video presentation a 2 Group (hypochondriacal / control) x 2 Time (pre-test / post-test) ANOVA revealed a significant effect of Group ($F(1,52) = 21.53$; $p < 0.001$). This refers to the finding that hypochondriacal subjects show higher overall symptom reporting than controls (see Figure 4). There was a significant effect of Time ($F(1,52) = 6.55$; $p < 0.05$), indicating that the reporting of bodily signals was relatively high before, and relatively low after watching the video. There was no interaction effect between Group and Time. As can be seen in Figure 4, this reflects the finding that the symptom reporting pattern was similar for both groups.

Figure 4. Symptom reporting before and after watching a cancer video



Discussion

The major findings of the present study can be summarized as follows:
First, no differences were found in cancer knowledge growth between hypochondriacal subjects and healthy controls. A one-year follow-up did not reveal differential effects; in both groups cancer knowledge had decreased markedly, still remaining significantly higher than before receiving cancer information. These results are inconsistent with the hypothesis that hypochondriacal subjects benefit less from being provided with cancer information.
Second, groups differentially changed their tendency to agree with threat after getting cancer information. Although both groups more often considered a threatening statement to be true, healthy subjects were more strongly affected in this way by the cancer messages. Ceiling effects in the hypochondriacal group could not explain this effect. In other words, contrary to what was predicted, when confronted with cancer information both hypochondriacal and healthy subjects increasingly choose to agree with threat and to disagree with safety, irrespective of the facts.
Third, contradicting the expectation, being informed about cancer facts caused a decrease in healthy controls' overall reporting of bodily symptoms, whereas hypochondriacal subjects' overall symptom reporting remained unaffected. Hence, the anticipated increase in hypochondriacs did *not* occur.
Although our hypochondriacal group reported higher anxiety levels and more feelings of threat caused by the cancer video, this did not lead to less cancer knowledge growth in these subjects as compared to controls. As anxiety is often associated with general performance decreases (Wells & Matthews, 1994), this might imply that without limitations caused by anxiety, the observed trend towards higher post-test cancer knowledge levels in our hypochondriacal subjects would have reached significance.
As to perceived threat and safety, it is remarkable to see the solid change brought about by the cancer education video in healthy subjects. Even one year after having watched the video, they continued to agree with threat more than they did in the pre-test. Being confronted with cancer information apparently initiated a cognitive change in our non-hypochondriacal group, appearing from a more negative attitude towards (and maybe more worries about) a topic that they previously did not go deeply into.
Our results on symptom reporting in hypochondriacal subjects are in line with studies indicating that anxiety, distress (Watson & Pennebaker, 1989) and hypervigilance (Brownlee & Leventhal, 1992) cause subjects to report more symptoms. However, it seems that the cancer video caused mainly distraction from internal cues instead of directing the subjects' attention inwards, resulting in stabilization or decrease of reported bodily symptoms in hypochondriacal and healthy controls respectively. Also, by not allowing our subjects enough time to elaborate upon the information, we may have prevented psychophysiological responses and symptom perception to occur.
Some other methodological limitations of our study must be pointed out. In the first place, a selection bias may have occurred, as our hypochondriacal respondents were selected by means of a newspaper advertisement. Patients with

particularly debilitating hypochondriacal concerns, for example, may be more likely to be found via health care sources. Also, self-selection may have caused only part of those eligible to volunteer and actually participate in this study. Besides, as fear of cancer was one of the selection criteria, our hypochondriacal group may not be representative of hypochondriacal subjects in general. Concerning the proportion of the subjects who mentioned cancer as their main health concern, it can be said that fear of cancer was prominent in each of the hypochondriacal subjects, some of them fearing other diseases as well, others mainly focussing on cancer. As we were not interested in the comparative importance of cancer worries, we cannot and do not go into that matter. Moreover, post-test measurements of cancer knowledge level may have been influenced by the procedure that was used, as the time interval between pre- and post-test was only about 70 minutes. Perhaps, choosing a longer interval would have induced significant differences between groups. As far as follow-up data are concerned, it should be noted that hypochondriacal subjects who dropped out were the ones that showed less knowledge increase in the post-test. This may have optimistically distorted follow-up knowledge levels in the hypochondriacal group.

Some remarks are in order with regard to the implications of the current findings for understanding and educating hypochondriacal and healthy subjects. Within our healthy group post-test knowledge growth was accompanied by more threat agreement and less reassurance disagreement. This may indicate that healthy subjects' attitude towards cancer is positively biased prior to receiving health education, accounting for less worry about the topic.

Furthermore, our cancer video was based on information brochures distributed by a national cancer organization on behalf of cancer patients. The purpose of these brochures is to provide objective information about the disease. Our results show that factual information about serious illnesses caused a lasting increase in knowledge in both groups, and, in healthy subjects, also a lasting increase in threat perception. Healthy subjects' pre-test estimations of perceived threat are reminiscent of a phenomenon described elsewhere as 'unrealistic optimism'. This refers to a more general tendency found in healthy subjects to judge own probabilities for positive and negative events as more favourable than the probabilities for an average other (Weinstein, 1980). The presentation of cancer information seems to have diminished this optimism, i.e. to have enhanced post-test threat agreement, making healthy subjects sadder but wiser. With regard to hypochondriacal subjects, it is demonstrated that providing factual information about a serious disease, a strategy often used in doctor-patient communication, does not suffice when dealing with hypochondriacal patients.

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Chapter 9

Hypochondriacal patients' danger estimation and their responsiveness to threat and safety information

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Submitted for publication

Abstract

Based on hypochondriacal patients' tendency to overestimate the seriousness of bodily sensations and health risks (Barsky et al. 1990; Warwick & Salkovskis, 1990), we first investigated whether hypochondriacal patients (n=20) are inclined to report higher danger estimates than healthy controls (n=20) when interpreting ambiguous health related and non-health related events. Secondly, we explored the influence of additional threat and safety information on hypochondriacs' danger estimation. Following the cognitive-behavioural model of hypochondriasis (Warwick & Salkovskis, 1989) we hypothesized that hypochondriacal subjects would be more responsive to threat messages (i.e. more increase in danger estimation) and less responsive to safety messages (i.e. less decrease in danger estimation) compared to healthy controls. Hypochondriacs were neither found to be immune for safety information, nor to be hypersensitive to danger information. Meanwhile, irrespective of the additional danger or safety information, hypochondriacs clearly showed a domain-specific bias towards higher danger perception in ambiguous health-related situations.

Introduction

There is considerable evidence that increased anxiety generally causes people to interpret ambiguous information in a threatening way (e.g. Eysenck, Mogg, May, Richards & Mathews, 1991; Mineka & Sutton, 1992), to overestimate the probability of negative events (Butler & Mathews, 1983; Lucock & Salkovskis, 1988) and personal danger (Mathews & MacLeod, 1985), and to underestimate the probability of pleasant events (Lucock & Salkovskis, 1988). In addition, there is evidence to suggest that increased anxiety heightens the perceived probability of negative outcomes, both for events related to the origin of the anxiety and for other, unrelated events (Butler & Mathews, 1983; Lucock & Salkovskis,1988).

With respect to threat perception in hypochondriasis it has been suggested that hypochondriacal patients catastrophize health issues by overestimating the dangerousness of bodily signs and symptoms and believing that a particular illness is more probable than it really is (Salkovskis, 1989; Salkovskis & Warwick, 1986; Warwick & Salkovskis, 1989; Warwick and Salkovskis, 1990). Regarding the specificity of hypochondriacal subjects' attitude towards health issues, Barsky (1992) wondered whether people with hypochondriasis suffer fundamentally a disorder of bodily perception and cognitive misinterpretation or, instead, a disorder of excessive alarm and inappropriate fear in which health is only one of many sources of overconcern and anxiety. If the latter is true, hypochondriacal patients might be, as Barsky et al. (1990) stated, "...more querulous, fretful and fault-finding with regard to their finances, their marriages, and their jobs". Their hypochondriacal problems would then be part of a more general, trait-like characteristic, in which discomfort is experienced at all times and across situations, as is defined by negative affectivity.

Another main feature of hypochondriasis is the lack of adequate response to medical reassurance (APA, 1994). Hypochondriacal persons often keep worrying about their health condition despite all efforts made by physicians to give a plausible explanation for the patients' complaints and a sense of reassurance. In other words, hypochondriacs appear immune towards attempts to remove their health anxiety. Meanwhile, empirical evidence (Haenen, Schmidt, Schoenmakers & Van den Hout, *in press*) and clinical experience suggest that, along with this 'insensitiveness' to reassuring safety messages, hypochondriacs are highly sensitive to threat messages such as cancer information on television or in medical brochures. Thus, as compared to non-hypochondriacal subjects, hypochondriacal patients seem to overreact to threat messages, while remaining fairly unaffected by safety messages.

The major aim of the present study was to explore further hypochondriacs' bias to overestimate the probability of negative events and to see whether this bias is a general phenomenon (cf. Barsky et al., 1990) or restricted to the domain of their concern. More specifically, we investigated whether hypochondriacal patients report relatively high danger estimations when judging ambiguous situations which are either health related or non-health related. In addition, we explored the possible differential effects of threat and safety messages as follow from Warwick and Salkovskis' (1989) cognitive-behavioural model of hypochondriasis. Therefore, we presented subjects with ambiguous health related and non-

health related scripts, and asked them to rate the situations' dangerousness. To explore the possible differential effects of threat and safety messages this procedure was repeated with the inclusion of additional threat or safety information. As it might well be that danger estimations and responsiveness to threat and safety are influenced by the subjects' state anxiety, rigidity, or affectivity, as well as by their ability to imagine the situations presented in the scripts, or their tendency to give socially desirable answers, these aspects were also taken into account in the measurements.

Method

Subjects

Twenty hypochondriacal subjects (10 male, 10 female) according to DSM-III-R (APA, 1987) criteria participated in the study. Subjects were selected via an advertisement in a local newspaper in which some characteristics of hypochondriasis were mentioned (complaints, anxiety or disease conviction, anxiety remaining despite medical reassurance). Seventy-five subjects responded to the advertisement. Subjects who had physical complaints in absence of health preoccupation as well as those who were not medically examined or who wanted a second opinion, were excluded from the experiment. Then, a first selection was made using the Structured Diagnostic Interview for Hypochondriasis (SDIH; Barsky, Cleary, Wyshak, Spitzer, Williams & Klerman, 1992). Subsequently, the remaining 34 subjects were interviewed by a diagnostically skilled health scientist using the Structured Clinical Interview for DSM-III-R Disorders (SCID; Spitzer, Williams, Gibbon & First, 1992). Twenty-one subjects were given the diagnosis hypochondriasis, one of whom could not participate because her knowledge of the Dutch language was too limited. The Anxiety Syndromes and Affective Syndromes sections of the SCID were used to measure possible additional diagnoses (see Table 1 below).

Mean age of the hypochondriacal group was 50.9 years (SD = 10.1; range 33-67). At the time of the study, one of the subjects was receiving psychological treatment. Mean duration of persistent health anxiety, as reported by the subjects, was 7.6 years (SD = 7.0; range 0.5-24.0 years). Subjects also completed the Maastrichter Eigen Gezondheids-Attitude en Hypochondrie-schaal (MEGAH; Schmidt & Lousberg, 1992), a Dutch questionnaire measuring self-reported health attitudes and severity of hypochondriasis. The Angst Eigen gezondheid (AE: fearful preoccupation with own health) subscale of the MEGAH was used to assess hypochondriacal complaints. This validated subscale includes 12 items ranging from 12 (maximal complaints) to 60 (minimal complaints). Scores below 40 are indications of (pathological) hypochondriacal fear and insecurity. In the hypochondriacal group mean score on the AE subscale was 29.1 (SD = 13.8; range 12-56). In 12 subjects anxiety was focussed around one specific disease type; in 8 subjects more than one disease was feared. Table 2 shows the frequencies of the diseases that were mentioned.

Table 1. Comorbidity in the hypochondriasis group (n=20)

SCID-diagnosis	*n*
Panic Disorder	4
Agoraphobia	2
Social Phobia	4
Simple Phobia	2
Obsessive Compulsive Disorder	1
Post Traumatic Stress Disorder	5
Generalized Anxiety Disorder	4
Bipolar Disorder, past	2
Major Depression, present	8
Major Depression / Depressive episode, past	6
Dysthymia	2

Table 2. Health threats feared by the hypochondriacal group (n=20)

Health threat	*n*
Cancer	
- in general	6
- gynaecological	2
- lung	3
- throat	1
- intestine	4
- bone	1
- bladder	2
Heart attack	6
Brain tumour / cerebral haemorrhage	3
Bronchial tubes	1
Paralysis / multiple sclerosis	1
Poisoning	2

The control group consisted of 20 healthy subjects (10 male, 10 female), matched for sex, age, and educational level. These subjects responded to an advertisement which stressed the presence of good health. These subjects were admitted to the experiment after screening for the absence of health problems and health-related worries*.

Mean age of these subjects was 51.6 years (SD=9.2; range 35-69). Mean AE-score in the healthy group was 52.9 (SD=7.8; range 31-60); AE scores differed signifi-

* We used a screening list asking for the following facts: Do you have any complaints about your health? Do you have an illness which has been diagnosed by your doctor? Are you being treated or have you been treated recently for an illness? Are you concerned about your health? All of these questions had to be answered "No" in order to be considered 'healthy'.

cantly from those of the hypochondriacal subjects [$t(38) = -6.70$, $p < 0.001$]. In advance, control subjects were matched for sex, age and level of education with hypochondriacal sub-jects. In both groups mean level of education, scored on an ordinal scale ranging from primary school (1) to university education (9), was 5.25 (range 4-6). All subjects were paid after participation.

Materials

State and Trait Anxiety Inventory (STAI; Spielberger, 1983).

Level of state anxiety was measured on a 20 items 4-point scale (1=not at all; 4=extremely). Total scores on this questionnaire were used in order to allow state anxiety effects on completing the questionnaires to be examined.

Questionnaire upon Mental Imagery (QMI; Sheehan, 1967).

The short version of the QMI is an instrument which is developed to assess imagery ability. It consists of 35 items covering seven sensory modalities. The subject is asked to evoke images of visual, auditory, cutaneous, kinaesthetic, gustatory, olfactory and organic stimuli. Vividness of imagery can be scored on a 7-point scale (1=image perfectly clear and vivid; 7=no image present at all). This questionnaire was used to allow experimental effects due to differences in imagery abilities to be ruled out.

Rigidity Questionnaire (RQ, selection from the Nederlandse Persoonlijkheids Vragenlijst NPV; Luteijn, Starren & Van Dijk, 1969).

This questionnaire contains the 25 items of the Dutch personality questionnaire measuring rigidity. Answering categories were "true", "false" and "?". Theoretically, total scores range from 25 (extremely rigid) to 75 (not at all rigid). This questionnaire was used as a means to explore danger perception changes and rigidity interaction effects.

Positive and Negative Affect Schedule (PANAS; Watson, Clark & Tellegen, 1988).

The PANAS contains two 10-item mood scales designed to measure positive and negative affect in general. Persons high in negative affectivity are more likely to report distress, discomfort and dissatisfaction at all times and across situations, even in the absence of overt stress, and to dwell on the negative side of themselves and the world. Answering categories range from 1 (not at all) to 5 (extremely). The scales are shown to be highly internally consistent and stable, and to have excellent convergent and discriminant correlations.

Marlowe-Crowne Social Desirability Scale (SDS; Crowne & Marlowe, 1964). This is a 14-item scale reflecting the subjects inclination to respond in a socially desirable manner. The SDS was used to explore danger perception and social desirability interaction effects.

Danger Perception Questionnaire (DPQ).

The DPQ questionnaire was composed to measure danger perception in ambiguous (hence possibly dangerous) health related and non-health related situations, as well as the tendency to be either negatively or positively influenced by additional information about these specific situations. In a pilot study (*unpublished data*) 32 randomly selected undergraduate students (age 18-24 yrs) at Maastricht University were asked to identify with and to judge 30 short, ambiguous scripts on 100 mm visual analogue scales. Complete scripts were made up of a basic

script (3 to 6 sentences) and of an additional message reflecting threat or safety (1 to 3 sentences). Scripts were formulated in third person singular and had to meet the following requirements to be selected for the final questionnaire: (1) basic scripts should have a mean danger judgement score of at least 20 in order to prevent floor effects, and at the most 80 in order to prevent ceiling effects; (2) additional threat (or safety) messages should induce an increase (or decrease) in mean danger judgement score in order to be considered effective and (3) despite additional messages, ambiguity should be reduced but not eliminated. Fifteen out of 32 scripts appeared to be satisfactory. Subsequently, five additional scripts were admitted after improvement of the formulation. The remaining scripts were dropped. This resulted in the final version of the DPQ: 20 basic, ambiguous scripts, either health related (10) or non-health related (10). Initially, subjects were requested to identify themselves with the situation that was described. Next, subjects evaluated each script on two 100 mm visual analogue scales (VASs) by judging the situations **seriousness** (*"How serious do you consider this situation to be?"*, 0=not serious at all; 100=extremely serious) and the **probability** that the ambiguous situation would cause real danger (*"Suppose this situation applies to you. What do you expect to be the likelihood that* [the ambiguous event] *will occur?"*, 0=very small; 100=very great). After 30 minutes, the same scripts were presented again, each with additional information describing a safety message (5 health related / 5 non-health related) or a threat message (5 health related / 5 non-health related). Schematically, this can be displayed as follows (see Table 3):

Table 3. Type of scripts used in the DPQ

	safety information added	threat information added
10 basic scripts, health related	5	5
10 basic scripts, non-health related	5	5

Below, examples are given of health related and non-health related scripts:

Health related

basic script: From the newspaper you learn that the little lake you swam in only a day ago, has been polluted. A plant dumped toxic waste material in this lake. After swallowing water from this lake all sorts of morbid symptoms might occur.

threat message: The morbid symptoms are various. It is not yet known which treatment will be effective. People who have swum in this lake recently should contact their family doctor (GP)

safety message: You have contacted your family doctor. He thinks that the waste material concerned will be harmless.

Non-health related

basic script:	You have been away for the evening and arrive home around midnight. When arriving home you see that the front door is open.
threat message:	On entering you see that the cupboard have been looted. The cupboards' contents is on the floor.
safety message:	On entering you do not notice anything suspicious. It seems that nobody has been inside.

For each script the participants **danger estimation** was computed as follows: (estimated seriousness x estimated probability / 100). Theoretically, danger estimations range from 0 (no danger) to 100 (extreme danger). Finally, for each participant 6 mean danger estimation scores were calculated, half referring to health related scripts (basic; basic plus safety information; basic plus threat information) and half referring to non-health related scripts (idem). Across participants, each script was presented equally often with threat information as with safety information. Although scripts were randomly arranged in a fixed order, different versions were made, each starting at a different point within this order. The version that was presented was identical for each hypochondriacal subject and its matched control subject.

Procedure

Participants were tested individually. Upon entering the laboratory, subjects completed the state anxiety VAS, the QMI, and the RQ. Next, the MEGAH, the PANAS, the SDS, and the DPQ were filled in. The DPQ was presented twice, with subjects participating in a 30 minutes memory test (as part of another study) in between. The entire procedure lasted for about 90 minutes. A research assistant introduced all tasks and was then seated in a separate room.

Results

Descriptive measures

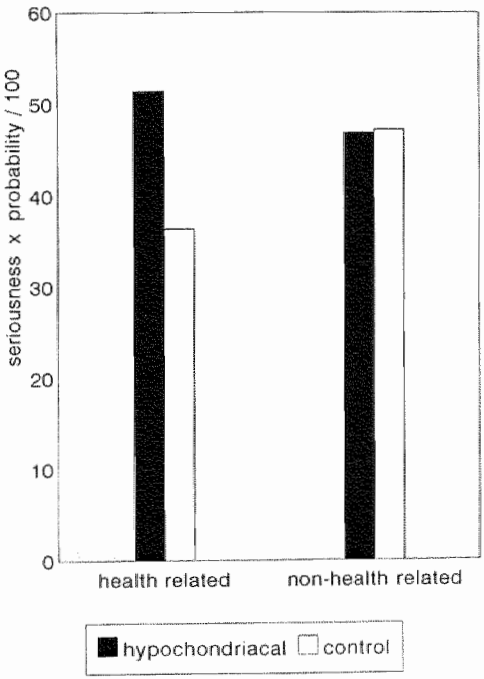
Mean state anxiety (STAI) total score upon arrival in the laboratory was significantly higher in hypochondriacal subjects, mean scores being 44.7 (SD = 12.5) vs 31.5 (SD = 8.5) in the control group [$t(36) = 3.51$, $p < 0.001$]. Mental imagery as measured by the QMI revealed no differences between hypochondriacs and healthy controls (M = 86.8; SD = 29.3 vs M = 77.7; SD = 22.4) [$t(31) = 1.01$; n.s.]. Also, rigidity (RQ) total scores were highly similar for hypochondriacal subjects and controls (M = 39.6; SD = 8.0 vs M = 42.5; SD = 11.3) [$t(37) = -0.94$; n.s.]. As to emotional states, hypochondriacal subjects scored higher on the PANAS negative affect scale (M = 29.8; SD = 8.9 vs M = 17.6; SD = 5.2) [$t(36) = 5.18$, $p < 0.001$]. No differences between these groups were found concerning the reporting of positive affect (M = 30.4; SD = 5.8 vs M = 33.7; SD = 5.0) [$t(35) = -1.86$, n.s.]. SDS results revealed no differences between hypochondriacs and controls in their tendency to give socially desirable responses, mean total scores being 965.2 (SD = 148.5) and 911.3 (SD = 145.3) [$t(38) = 1.16$, n.s.].

Danger estimation

General

Mean estimated danger scores regarding ambiguous scripts are presented in Figure 1. A 2 Group (hypochondriacal / control) x 2 Domain (health related / non-health related) ANOVA revealed a marginally significant effect of Group [$F(1,37) = 2.90$, $P = 0.097$]. Thus hypochondriacs generally tended to display higher danger judgements than healthy controls. There was no main effect of Domain [$F(1,37) = 2.59$]. Interestingly, there was a significant interaction between Group and Domain [$F(1,37) = 13.58$, $P < 0.005$]. Post-hoc t-tests indicated that this interaction reflects the finding that hypochondriacs are characterized by higher danger estimations than controls when judging ambiguous health related scripts [$t(38) = 2.92$, $p < 0.01$], but not when judging non-health related scripts [$t(37) = -0.07$, $p = 0.95$].

Figure 1. Danger estimations of ambiguous health related and non-health related basic scripts for both the hypochondriacal participants and the healthy control individuals

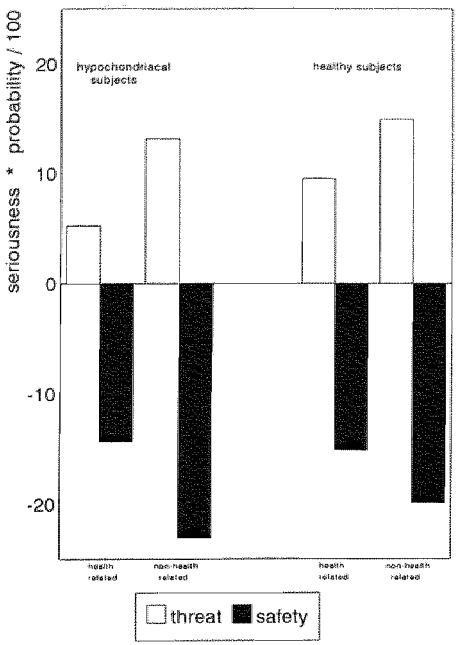


Safety and danger information

The differential effects of threat and safety messages are presented in Figure 2. A 2 Group (hypochondriacal / control) x 2 Domain (health related / non-health related) x 2 Message (threat / safety) ANOVA revealed a main effect of Message

[F(1,35) = 142.35, $P < 0.001$]. This indicated that participants' danger estimations were relatively high in case of threat messages and relatively low in case of safety messages. There was no significant interaction between Group and Message [F(1,35) = 0.07], implying that, on the whole, this estimation pattern was similar for both groups.

Figure 2. Danger estimations in response to health related and non-health related threat information and safety information, relative to ambiguous basic scripts, for both hypochondriacal participants and healthy control individuals



There was a significant interaction between Domain and Message [F(1,35) = 22.21, $P < 0.001$]. As can be seen in Figure 2, this reflects the finding that the effects of safety and threat messages were relatively pronounced in non-health related scripts. Finally, there was no significant Group x Domain x Message interaction [F(1,35) = 0.95]. Hence no evidence emerged to suggest that hypochondriacs are characterized by a domain-specific pattern of threat-overestimation and safety-underestimation.

Discussion

The major results of the present study can be summarized as follows. First, hypochondriacal subjects were characterized by higher danger estimations than controls but only when judging ambiguous health related scripts. Thus, no general bias to overestimate the probability of negative events was found. Second, both groups

changed their danger estimations in response to additional threat and safety information. Third, this effect of threat and safety information was, in general, most pronounced in non-health related scripts. Fourth, no evidence emerged to suggest that hypochondriacs are *hyper*responsive to threat messages or *hypo*-responsive to safety messages (neither in the context of health issues, nor in the context of non-health related issues).

The present finding that our hypochondriacal subjects tended to relatively over-estimate the danger of domain-specific ambiguous situations only, does not support Barsky's suggestion that hypochondriacs' worrying may be a general characteristic. Instead, a differential accessibility pattern might underlie hypochondriacal subjects' danger estimation of ambiguous health related issues. Discussing cognition in highly trait-anxious worriers, MacLeod, Williams and Bekerian (1991) have proposed the existence of such a particular pattern, characterized by an increased accessibility of explanations for why a negative, in casu health related, event would occur, combined with a reduced accessibility of explanations for why it would not.

Surprisingly, although hypochondriacal subjects considered ambiguous health related situations to be more dangerous, they did not show a stronger increase in domain-specific danger estimation following threat messages, or a smaller decrease in danger estimation following safety messages. Besides, our data showed that hypochondriacal subjects were as willing as controls to change their opinion when evaluating health related and non-health related situations. The finding that hypochondriacal subjects were as 'open' to threat and reassurance as controls were, together with the finding that both groups appeared not to differ on an objective rigidity measure, cast serious doubts on the idea that rigidity plays a significant role in the etiology of hypochondriasis.

With regard to hypochondriacs' responsiveness to the additional information, it should be acknowledged that it can not be ruled out that the effects of the safety messages in the current study were only temporarily effective. Nevertheless the present data clearly demonstrate that hypochondriacal subjects are not totally 'immune' to safety infor-mation. As for threat messages, the current results do not seem to be in line with an earlier study (Haenen et al., *in press*), in which hypochondriacs' proved to subscribe to danger information more often than did healthy controls. In the present study patients appeared no more sensitive to threat messages than controls. This discrepancy may be attributable to ceiling effects in hypochondriacs' evaluation of the health related situations. It seems that the non-hypochondriacal subjects were more likely to access positive interpretations of ambiguous health related events than hypochondriacal subjects. Relatively low initial state anxiety levels may have been responsible for this, as non-anxious subjects were previously found to be more likely to access positive interpretations of relevant, ambiguously-threatening events than highly anxious individuals (Hirsch & Mathews, 1997). It has been suggested that a positive interpretation bias in non-anxious individuals is likely to serve a protective function by helping the individual to maintain a positive and confident mood state.

As to the effect of mood on threat estimation, one may wonder whether it was our subjects' hypochondriacal disorder or their comorbid depression (or both) that

caused them to give higher danger estimations with regard to ambiguous health related issues. In addition, Watson and Clark (1984) mention several studies indicating that individuals high in negative affectivity show a general tendency to interpret ambiguous stimuli in a more negative way. The fact that our patient group demonstrated a specific (i.e. health related), rather than a general bias, leads us to conclude that the findings are related to hypochondriasis, not depression or negative affectivity.

Although imagining an event has been shown to lead to increased estimates of its likelihood (Gregory, Cialdini & Carpenter, 1982), this most likely does not explain higher health related danger estimations in our hypochondriacal subjects; QMI scores of hypochondriacal participants were highly similar to those of the controls. Yet, it should be acknowledged that the instrument we used is thought to index a general trait, which may differ from subjects' ability to imagine a domain-specific event.

Some methodological limitations of the present study need to be addressed. The questionnaire we used in the present study to measure danger perception was developed in a pilot study in which students participated. This may have resulted in a list of items that are not of sufficient sensitivity to elicit hypochondriacal response tendencies. Relatedly, it should be admitted that probably not all of the DPQ's health related items will have addressed personally relevant events. Regarding this issue, Mathews (1990) postulated that there is an association between the extent that individuals worry about a certain event, and how much they see themselves at risk from that event. Unfortunately, this kind of data is lacking with regard to the present participants.

Furthermore, in the present study, the DPQ was presented twice (i.e., without and with additional information). This procedure might have influenced the effect of the additional (threat/safety) messages on participants' danger estimations by eliciting a consistency bias. However, it should be noted that the inclination to respond in a socially desirable manner was highly comparable for both groups.

To summarize, in line with the cognitive-behavioural model the current data support the idea that hypochondriasis is characterized by a domain-specific negative interpretation of ambiguous information. However, no evidence emerged to sustain the idea that hypochondriacs are hypersensitive to threatening information or relatively immune for reassuring information in the context of health issues.

Acknowledgements - The authors are grateful to Nicole Haenen for the translation of DPQ-scripts.

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Chapter 10

General discussion

The objective of this thesis was to examine aspects of the cognitive-behavioural model of hypochondriasis proposed by Warwick and Salkovskis. To this end, six studies were performed, each depicting one or two of the model's empirical suggestions. The aim of this final chapter is to summarize and discuss the major findings and their implications for the model of hypochondriasis. Also, clinical issues are addressed. Finally, the studies main conclusions are formulated.

10.1 Summary of the main findings

We tested two different types of hypotheses. The first type followed directly from the model, such as the assumption of an enhanced bodily perception in hypochondriasis. The second type was indirectly linked to the model, its formulation being inspired by the model, such as in our study on suggestibility in hypochondriacal subjects. We found confirming evidence for some of the model's implications, and disconfirming evidence for others.

As for the model's direct implications, confirmation was found for the existence of an attentional focus on one's own body and an enhanced bodily perception in hypochondriasis. This evidence came from a subjective measure, namely reporting of bodily symptoms, which proved to be higher in a neutral condition as well as in an attention condition (see Chapter 4) as well as prior to and after watching a cancer video.

In clear contradiction with the model's suggestion, no confirmation was found for the expected discounting of positive information by hypochondriacal subjects, nor for the presumed preference to attend to negative information. First, this was demonstrated in a study using knowledge levels of threatening and reassuring cancer aspects as indicators of such a differential information processing style (see Chapter 7). Then, considering high threat agreement and reassurance disagreement to be indicative of the proposed confirmatory bias, only a higher threat agreement could be confirmed, and only prior to receiving cancer education. After cancer information had been given, no evidence was found for either of the expected patterns (see Chapter 8). Lastly, when investigating the effect of additional, non-ambiguous information on hypochondriacs' danger estimations, a relatively high responsiveness to threatening additional information and a relatively low responsiveness to reassuring additional information was expected but not found (see Chapter 9).

With regard to aspects that are indirectly related to the model, first, a difference in objective perception differences - bodily sensitivity - was identified as a factor possibly underlying hypochondriacs' higher symptom reporting (see Chapter 5). This hypothesis then had to be rejected because hypochondriacal patients' two-point discrimination threshold appeared not to differ from that found in healthy individuals. Next, high suggestibility was mentioned as a possible explanation for the high reporting of bodily signals (see Chapter 6). It was hypothesized that hypochondriacal patients would be more easily influenced by the expectation of a forthcoming proprioceptive stimulus. Surprisingly, however, the opposite appeared to be the case, as hypochondriacal subjects reported less often the perception of a proprioceptive non-signal than healthy individuals did.

Some of the results described above justify further elaboration. They will therefore be addressed in more detail in the following section.

10.2 Unexpected findings

Suggestibility

The study in Chapter 6 showed that hypochondriacal subjects are less likely than healthy persons to respond to the leading announcement that a particular bodily sensation may soon come up. Apparently, under such circumstances they are less inclined to report internal experiences.

At first glance these results may seem irreconcilable with what was found in our first experiment, where directing the hypochondriacs' attention inwards in the absence of physical stimulation, instead, caused a symptom-reporting increase. Perhaps this demonstrates the overriding importance of the type of signal suggested. Hypochondriacal patients' higher symptom reporting in our first study may stem from the self-suggestion of a feared sensation, such as a pounding heart, or at least from the freedom to choose such a sensation as the focus of one's attention. Suggesting a specific, probably non-dreaded signal, as was done in the third study, clearly does not have this effect.

Notwithstanding the methodological limitations of the study (see Chapter 6), it is highly interesting to find an indication of *hypo*suggestibility in hypochondriacal subjects. By identifying hyposuggestibility we at least seem to have ruled out a specific output phenomenon (i.e. reporting elicited by the instruction) as a viable explanation for the higher symptom reporting found in hypochondriacs. But, in the light of our studies, how can hypochondriacs' hyposuggestibility be understood?

Based on this result, one might conclude that hypochondriacs are more accurate perceivers than controls are, as they are less likely to 'notice' suggested, but non-existing sensations. Such superior perceptual abilities may be the result of a frequent rehearsal in perceiving bodily signals by constantly attending to such cues. Alternatively, hypochondriacs' distrustful attitude towards suggestions given by others may have been decisive. Although medical practitioners claim that nothing is wrong with the patient's health, the patient remains convinced that his bodily sensations may point out serious danger. In other words, the hypochondriac has resolved to keep a level head. As a result, any suggestion that a specific sensation is present (see Chapter 6), or, perhaps, absent, leaves him relatively unaffected. In the light of matters concerning his internal state, it has therefore become second nature to him not to follow anyone's suggestions but his own. This attitude presumably stems from his cognitions regarding health and illness. Hypochondriacal patients believe good health to be relatively symptom-free, more symptoms to be indicative of sickness (Barsky et al., 1993) and ordinary bodily signs and symptoms to be more dangerous than they really are (Warwick and Salkovskis, 1990). They consider themselves vulnerable to illness and injury (Barsky & Wyshak, 1989) and they are inclined to amplify bodily sensations (Barsky, 1992) and to be overinclusive when identifying cancer warning signs (see Chapter 7). Moreover, when rating its relative importance, health is classified by hypochondriacs, but not by healthy individuals, as the most important value in life

(Schmidt, *unpublished paper*). Such beliefs about health and illness form an enduring cognitive structure which guides a person's attention, perception, memory and judgement. The hypochondriac thus stays alert, continuously scanning for internal cues, screening his somatic perceptions and reporting many of these on request (see Chapter 4). In doing so, he is strongly oriented towards his internal experiences and his personal interpretation of these.
It should be acknowledged, however, that our data does not allow us to determine causality regarding this matter. Limited suggestibility may predispose someone to develop hypochondriasis, but the same may also follow from the process that has been described in the preceding section.

Knowledge
Although the cognitive-behavioural model does not include well-defined assumptions regarding medical knowledge levels, it does predict that hypochondriacal patients are typified by 'scanning for information', 'attention to negative information' and 'discounting positive information'. Hypochondriacal subjects are said to selectively notice and remember information consistent with their negative beliefs about their problems. Such processing of medical information was expected to affect a person's knowledge levels in general. Moreover, according to us, it would selectively affect someone's response to medical information with a threatening or reassuring content.
We indeed found hypochondriacs display a monitoring coping style - i.e. to scan for information - more than healthy persons do, as was expected from the theory. Thus, although clinicians sometimes argue that some hypochondriacs prefer to monitor whereas others are more inclined to blunt, we found confirmation only for a monitoring coping style. This scanning for information did not, however, result in higher cancer knowledge levels.
When asked to identify actual health threat signals, hypochondriacs overinclude harm-less bodily signals, thereby demonstrating their misinterpretation of body sensations or signs - one of the maintaining factors within the model. In other words, they seem to respond in a way described elsewhere (in a study concentrating on agoraphobic patients) as "assume danger unless proven otherwise" (McNally & Foa, 1987). This inclination to scent danger everywhere combined with striving for absolute certainty whenever health is the issue, keep hypochondriacal patients busy.
Apart from signal identification, in our initial study on cancer knowledge (see Chapter 7) we expected levels of general knowledge about a serious disease (in the case: cancer), and of knowledge about its threatening aspects, as well as a threat agreement and reassurance disagreement, to be relatively high. As for knowledge about reassuring aspects, relatively low levels were expected. Except for higher threat agreement, none of these hypotheses were confirmed.
On the basis of these results, in our subsequent study (see Chapter 8) we expected hypochondriacs to profit less than healthy individuals from watching a cancer information video, to be apparent in smaller knowledge increase. Moreover, they were expected to show more increase in threat agreement and safety (reassurance) disagreement. We found, however, that in both groups cancer

knowledge had increased significantly and to the same extent after watching the tape, while the increase in threat agreement was more obvious in healthy subjects than in hypochondriacs. The decrease in safety disagreement was highly comparable for both groups.

Why were we unable to pinpoint the proposed effects?
Attentional bias research has indicated that anxious subjects selectively attend to threat-relevant information (Williams, Watts, MacLeod & Mathews, 1988). As soon as threat has been detected, it is only briefly attended to, after which the anxious person may turn away from the threat. In that way, anxiety prevents full elaboration of threatening information. The same process may have occurred in our hypochondriacs when cancer information was presented. Assuming that attention and elaboration are both important prerequisites for knowledge growth, someone's level of knowledge about an illness will probably depend on the relative weight of these two factors.
Looking back, it is questionable whether knowledge levels and perceived threat and safety were adequate measures for the assumed way of handling health-related information. There may be alternative, and better, ways of investigating hypochondriacal patients' attending to the negative and discounting the positive. For example, recently is was studied to what extent hypochondriacal patients are characterized by a danger-confirming strategy while neglecting disconfirming evidence (De Jong, Haenen, Schmidt & Mayer, 1998). It appeared that, in the context of domain-specific (i.e. health-related) threat, hypochondriacs' danger-confirming reasoning pattern did not to differ from that found in healthy controls. Both groups were equally inclined to look for verification in case of danger and for falsification in case of safety. Thus, again, no evidence was found to support the cognitive style implied by the model.
We propose that hypochondriacal patients have great difficulties in accepting the fact that often bodily sensations are either inexplicable or reducible only to harmless causes. In other words, they demonstrate a low tolerance in respect to health-related ambiguity. For fear of not noticing a signal which indicates actual health threat, the hypochondriac cries wolf. The fact that one can be healthy and, at the same time, experience casual bodily sensations without a clear cause, keeps the hypochondriac trapped in his anxiety and his attentional bias. Besides, as it is impossible to confirm that someone is healthy - the absence of a specific illness is the utmost a doctor can assess - the hypochondriac remains dissatisfied and worried.

Threat and safety: perception and responsiveness
The hypochondriacal information processing style put forward by the cognitive-behavioural model has implications for the appreciation of and the response to health-related threat and safety information (see Chapter 9). Elaborating on the presumed bias towards ignoring positive information while acknowledging negative information, we found that only the evaluation of ambiguous health-related information is problematic for hypochondriacs. That is, when estimating danger of health-related and non-health-related ambiguous situations, those hypochondriacal

persons give relatively higher danger judgements with regard to the first type only. Additional information - either threatening or reassuring in nature - has the same effect in hypochondriacs as in healthy individuals. In other words, here again, it is a low tolerance of uncertainty regarding health topics that appears as a discriminating feature in hypochondriacal subjects. Although they respond to disambiguity in the way healthy subjects do, hypochondriacs' higher starting point - i.e. their higher danger estimation when judging ambiguous health-related situations - still leaves them with serious worries and anxiety towards these issues after safety information is given. As a result, their anxiety and need for reassurance persist.

10.3 Clinical and theoretical implications

clinical implications

Without losing sight of their tentative character, some suggestions about the clinical use of our results can be made. As for the clinical implications of our knowledge measurements, informing a hypochondriacal patient about aspects of serious illnesses in order to lower his health anxiety or disease conviction apparently is a rather dubious approach. Hypochondriacs do not differ from healthy subjects in this respect. We suggest that less attention should be paid to communicating facts about illness, as this is not the essential aspect of the hypochondriac's problem. Instead, health is the issue that should be addressed. Based on our observation that hypochondriacal patients misinterpret non-warning signs as warning signs of cancer (see Chapter 7), we conclude, in line with Barsky et al. (1993), that hypochondriacs have a greater tendency than healthy individuals to believe that common and ambiguous symptoms signify disease. It seems that, as long as bodily signals exist, and are misinterpreted as signalling a serious health threat, the hypochondriac's judgement regarding his internal cues ("there is something seriously wrong") is not influenced by corrective information. Treatment should therefore be cognitive, aiming at correcting those basic beliefs, helping the patient to gain more insight into the signal-increasing effect of attending to internal cues, confronting him with the impossibility of attaining absolute, lasting certainty with respect to one's health, and decreasing his intolerance to insecurity regarding health issues. Also, gaining more insight into the worrying process that accompanies hypochondriacal thought processes, that is, the endless cycle of looking for arguments for and against illness, may offer new starting points for hypochondriasis therapy.

theoretical implications

As for the theoretical implications of our results, some remarks can be made with respect to the cognitive-behavioural model of Warwick and Salkovskis. In addition, future research is warranted, which may eventually strengthen our tentative modification proposals.

The current model does not address the suggestibility issue when schematizing the development of hypochondriasis, nor when outlining its maintenance. It would be quite premature to recommend a major revision of the model based on the

single suggestibility study involved in this thesis. Therefore, above all, replication of our findings on hyposuggestibility is needed. Based on comparison of the two studies described in Chapters 4 and 6, it may be concluded that the hypochondriac's overattentiveness and overreportiveness with regard to bodily signals will depend partly or entirely on (a) self-directed attending to (b) one or more specific bodily signals, which are (c) dreaded and (d) self-relevant in character. Although the relative importance of any of these aspects should be addressed in future research, our results on hypochondriacs' hyposuggestibility underscore the importance of the first factor. Furthermore, with regard to self-relevance, others have indicated that patients are not unrealistic about illness per se, but only with respect to their own symptoms (Butler & Mathews, 1983).

Besides, it may be interesting to study hypochondriacs' response to stimuli that are delivered despite the announcement of non-deliverance. If our impression is right, then hypochondriacal patients will prove to be hyposuggestible again. Also, more research is needed focussing on hypochondriacal patients' response to pure suggestion. For example, how do hypochondriacs respond if the suggestion concerns their idiosyncratic complaints or fears? Does is matter whether the suggestion applies to trivial illnesses and bodily complaints ("at the moment many people have got the flu") or to serious illnesses ("more and more people seem to suffer from multiple sclerosis")? How do hypochondriacs respond to the suggestion of sensations which they are known to amplify? Finding a clear answer to these questions may help in clarifying the hyposuggestibility issue. If future research underscores our view, this would justify introducing a lack of responsiveness to suggestion as one of the cognitive characteristics within the model.

With regard to the diagnosis of hypochondriasis, DSM-IV mentions only the misinterpretation of bodily sensations, leaving the misinterpretation of medical information put forward by Warwick and Salkovskis' cognitive-behavioural model out of consideration. On account of our studies on cancer knowledge it seems justified not to include the latter type, as we found hardly any evidence showing that hypochondriacal patients differ from healthy individuals in their misinterpretation of medical information.

Before concluding that the model needs modification, more research is needed, using different paradigms in trying to identify the model's assumptions regarding this issue. On the presumption that future research will also fail to objectify the expected attending/discounting discrepancy with regard to medical information, it should be restricted or maybe dropped from the model.

Lastly, the differential effect of safety and threat suggested by the model could not be confirmed in our final study. Clearly, ambiguity is perceived in a more negative way by hypochondriacs as long as health-related issues are to be judged. The rather normal way to respond to reassurance and threat, however, is not in line with the second DSM-IV criterion, which refers to the hypochondriac's lack of responsiveness to medical reassurance.

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Summary

Good health is important to almost everyone. Some people consider it to be a matter of course, whereas others are preoccupied with bodily sensations and perceived bodily alterations. The DSM-IV psychiatric diagnosis of hypochondriasis applies to those who are extremely afraid of becoming, or even convinced to be, seriously ill. These persons repeatedly ask their physician for thorough examinations and reassurance, but this does not permanently reduce the chronic worrying about their health status.
Warwick and Salkovskis have proposed a cognitive-behavioural model, reflecting developmental and maintaining features of hypochondriasis. The present thesis contains six experimental studies which examine separate aspects of this theoretical model.

Chapter 1 provides a general introduction to the topic. It highlights the clinical picture of hypochondriasis, its history, diagnosis and frequency, as well as its assessment and treatment.

In *Chapter 2* Warwick and Salkovskis' model of hypochondriasis is outlined. From a cognitive-behavioural perspective, this schematic framework describes the developmental and maintaining mechanisms that are thought to underlie hypochondriasis. As such, it offers opportunities to systematically study separate aspects of the disorder.

Chapter 3 outlines the research questions of this thesis, the model's aspects on which they are based, as well as the model's predictions concerning the issues studied.

In *Chapter 4 up until 9*, six experimental studies are reported, each comparing the hypochondriacal subjects an non-hypochondriacal controls. The most important findings can be summarized as follows:

Chapter 4 describes a study addressing hypochondriacal patients' presumed focus on body and enhanced bodily perception mentioned in the model. Without using any means of physical stimulation, hypochondriacal and control subjects were instructed to report perceived sensations in three conditions: attention, distraction and control. It was hypothesized that hypochondriacal patients instruct themselves to constantly attend to internal cues, thereby making such instructions given by the experimenter ineffective (or less effective).
As expected, hypochondriacal subjects have remarkably higher levels of symptom reporting than non-hypocondriacal subjects in all three conditions. In spite of hypochondriacal subjects' excessive attention to bodily sensations in a non-instruction condition, attention instructions still add significantly to symptom reporting in these individuals. Group differences in symptom reporting are related to preoccupation with bodily symptoms rather than to general anxiety level.

Chapter 5 deals with an objective means of measuring tactual sensitivity to non-painful stimuli in hypochondriacal subjects and normal controls. This study is done

to investigate whether increased bodily sensitivity can account for enhanced bodily perception proposed in the cognitive-behavioural model. Two-point discrimination threshold and subjective sensitivity to harmless bodily sensations were used to objectify possible differences.
Hypochondriacal subjects are no more able to discriminate between two tactual bodily signals: their two-point discrimination threshold is not significantly lower than that found in controls. The fact that they do, however, consider themselves more sensitive to benign bodily sensations, emphasizes the importance of the disorder's cognitive aspects.

Chapter 6 focusses on hypochondriacal subjects' assumed overattentiveness and overreportiveness regarding bodily symptoms. It was studied whether the mere announcement of physical stimulation suffices in evoking sensation detection and reporting in hypochondriacs. To this end, electrical current was announced but not delivered. Suggestibility was objectified by the number of responses and by response latencies. It was expected that hypochondriacal subjects would be more easily influenced by the expectation of a forthcoming stimulus, leading to higher and quicker 'stimulus detection' than healthy subjects.
In contrast to these expectations, non-hypochondriacal subjects show higher response frequencies and lower response latencies. Hypochondriacal patients thus appear to be *less* influenced by the expectation that is raised.

Chapter 7 reports a study exploring whether the preference of attending to negative information and the discounting of positive information - both suggested by the model - are reflected in hypochondriacal subjects' current level of cancer knowledge. It was hypothesized that, relative to non-hypochondriacal controls, hypochondriacal subjects would know more about cancer in general and about cancer warning signs. Also, it was expected that the hypochondriacal group would agree more often and know more about threatening cancer statements. As for reassuring cancer statements, lower knowledge levels and less agreement were expected in the hypochondriasis group.
Most importantly, although groups do not differ in general level of cancer knowledge, hypochondriacal subjects more often falsely identify non-warning signs as cancer warning signs, and they more often agree with threatening cancer statements.

Chapter 8 also addresses the information processing characteristics in hypochondriasis that are suggested by cognitive-behavioural model. Here, cancer knowledge increase resulting from an experimental twenty-minute cancer education video was studied. Based on the theory, hypochondriacal subjects were expected to show relatively less post-test cancer knowledge increase, more increase in agreeing with threat and in disagreeing with safety, and more increase in the reporting of bodily symptoms.
Hypochondriacal and non-hypochondriacal subjects profit from cancer information significantly and to the same degree. Whereas initially hypochondriacs more often agree with threatening statements, after watching the cancer video groups no

longer differ in this respect. Having seen the cancer video, both groups are more inclined to disagree with safety. In addition, they report less bodily sensations.

Chapter 9 describes a study in which hypochondriacal subjects' bias to overestimate the probability of negative events was explored. This last study starts with investigating danger estimation in ambiguous health related and non-health related events in patients and controls. Elaborating on the presumed bias towards ignoring positive information while acknowledging negative information, it was hypothesized that hypochondriacal patients are more responsive to threat messages and less responsive to safety messages. The reporting of danger estimates was used as a means to objectify the presumed response style.
Although hypochondriacs clearly show a domain-specific bias towards higher danger perception in ambiguous *health-related* situations, they appear to be neither relatively immune for safety information, nor hypersensitive to danger information.

Chapter 10 summarizes the major findings and discusses unexpected results and their implications for the model of hypochondriasis. Clinical and theoretical issues are also addressed.
It is concluded that confirmation is found for the existence of an attentional focus on one's own body and an enhanced bodily perception in hypochondriasis, but not for the expected discounting of positive information by hypochondriacal subjects, nor for the presumed preference to attend to negative information. The unexpected difference in suggestibility seems to have ruled out a specific output phenomenon (i.e. reporting elicited by the instruction) as a viable explanation for the higher symptom reporting found in hypochondriacs. Both superior perceptual abilities - resulting from constantly attending to internal cues - and a distrustful attitude towards suggestion, may have been crucial here. Moreover, as believes about health, bodily symptoms and illness presumably guide someone's attention, perception, memory and judgement, hypochondriacal patients stay strongly oriented towards their internal experience and their personal interpretation of these.
With regard to cancer knowledge it appears that, notwithstanding their strong general inclination to scan for threatening information, hypochondriacs do not know more about cancer than non-hypochondriacs do. When asked to identify actual health threat signals, hypochondriacs demonstrate misinterpretation of body sensations or signs by overincluding harmless bodily signals. Not only do they scent danger everywhere, they also seem to strive for absolute certainty whenever health is the issue. In other words, they demonstrate a low tolerance in respect to health-related ambiguity. The fact that one can be healthy and, at the same time, experience casual bodily sensations without a clear cause, keeps the hypochondriac trapped in his anxiety and his attentional bias. Besides, as it is impossible to determine that someone is healthy - the absence of a specific illness is the utmost a doctor can assess - the hypochondriac remains dissatisfied and worried.
As compared to non-hypochondriacal subjects, hypochondriacal individuals give

higher danger judgement with regard to ambiguous health-related information. In other words, here again, it is a low tolerance of uncertainty regarding health topics that appears as a discriminating feature in hypochondriacal subjects. Additional threatening or reassuring information has the same effect on hypochondriacs as on healthy individuals. However, hypochondriacs' higher danger estimation when judging ambiguous health-related situations still leaves them with serious worries and anxiety towards these issues after safety information is given.

Doctors and therapists who inform a hypochondriacal patient about aspects of serious illnesses, in order to lower health anxiety or disease conviction, seem to use a rather dubious strategy. Instead of focussing on the dreaded illness, more attention should be paid to health. Treatment should be cognitive, aiming at correcting basic beliefs, helping the patient to gain more insight into the signal-increasing effect of attending to internal cues. Addressing the impossibility of attaining certainty with respect to one's health and decreasing intolerance to insecurity regarding health issues seem to be more effective. Finally, gaining insight into the endless cycle of looking for arguments for and against illness, may offer new starting points for hypochondriasis therapy.

Concerning the theoretical implications of our results, replicating our suggestibility study and further studying suggestibility in hypochondriacs might prove to be an interesting direction. If future research underscores our view, this would justify introducing a lack of responsiveness to suggestion as one of the cognitive characteristics within the model.

As for the misinterpretation of medical information put forward by Warwick and Salkovskis' model, we found hardly any evidence showing that hypochondriacal patients differ from healthy individuals. If, with regard to medical information, future research will also fail to objectify the expected discrepancy of attending to threat and discounting safety, it should be restricted or maybe left out from the model.

Clearly, health-related ambiguity is perceived in a more negative way by hypochondriacs. However, contrary to the second DSM-IV criterion, hypochondriacal patients seem to respond to additional reassuring and threatening information in a rather normal way.

Samenvatting

Bijna iedereen vindt een goede gezondheid belangrijk. Sommige mensen beschouwen het als een vanzelfsprekendheid, terwijl anderen in gedachten voortdurend bezig zijn met lichamelijke sensaties en waargenomen lichamelijke veranderingen. De DSM-IV psychiatrische diagnose hypochondrie heeft betrekking op degenen die ofwel extreem angstig zijn om ziek te worden of zelfs overtuigd zijn aan een ernstige ziekte te lijden. Deze mensen vragen hun arts herhaaldelijk om medisch onderzoek en geruststelling, maar dit leidt niet tot blijvende vermindering van het chronisch piekeren over de eigen gezondheidstoestand. Warwick en Salkovskis hebben een een cognitief-gedragsmatig model ontwikkeld, dat de kenmerken van de ontwikkeling en instandhouding van hypochondrie weergeeft. In deze dissertatie worden zes experimentele studies beschreven, waarin afzonderlijke aspecten van dit theoretisch model onder de loep genomen worden.

Hoofdstuk 1 geeft een algemene inleiding in het onderwerp. Hierin wordt het klinisch beeld van hypochondrie beschreven, alsmede de geschiedenis, diagnose en frequentie, en manieren om hypochondrie vast te stellen en te behandelen.

In *Hoofdstuk 2* wordt het model van hypochondrie, zoals dat door Warwick en Salkovskis is opgesteld, uiteengezet. Vanuit een cognitief-gedragsmatig perspectief worden op schematische wijze mechanismen beschreven, die ten grondslag liggen aan de ontwikkeling en instandhouding van hypochondrie. Als zodanig biedt het mogelijkheden om de afzonderlijke aspecten van hypochondrie systematisch te onderzoeken.

In *Hoofdstuk 3* worden de onderzoeksvragen van dit proefschrift uiteengezet, alsmede de aspecten van het model waarop zij gebaseerd zijn en de voorspellingen die het model doet ten aanzien van de bestudeerde thema's.

In *Hoofdstuk 4 tot en met Hoofdstuk 9* worden zes experimentele studies beschreven, waarin telkens hypochondere personen met niet-hypochonderen worden vergeleken. De belangrijkste bevindingen kunnen als volgt worden samengevat.

Hoofdstuk 4 beschrijft een studie waarin de aandacht op het eigen lichaam en de toegenomen lichamelijke waarneming, die bij hypochonderen verondersteld worden, centraal staan. Zonder fysieke prikkels te gebruiken, is hypochondere en controle proefpersonen gevraagd lichamelijke sensaties te rapporteren in drie condities: aandacht, afleiding en controle ('pauze'). Verondersteld werd dat hypochondere patiënten zichzelf instrueren om voortdurend op interne signalen te letten, waardoor het geen (of weinig) effect zou hebben als de proefleider hen daartoe ook nog zou instrueren.
Zoals verwacht werd, blijken hypochonderen in elk van de drie condities aanzienlijk meer lichamelijke symptomen te rapporteren dan niet-hypochonderen. Ondanks de overmatige aandacht van hypochonderen voor lichamelijke sensaties wanneer geen enkele instructie gegeven wordt, leiden aandachtsinstructies toch nog tot een toenamen in symptoomrapportagen van deze mensen. Groepsverschillen in symptoomrapportage blijken sterker in verband te staan met overmatige

aandacht voor lichamelijke symptomen dan met het algemeen angstniveau.

Hoofdstuk 5 besteedt aandacht aan een objectieve meting van lichamelijke gevoeligheid van hypochondere en niet-hypochondere proefpersonen voor niet-pijnlijke prikkels.
Deze studie is uitgevoerd om na te gaan of een toegenomen lichamelijke gevoeligheid een verklaring kan zijn voor de toegenomen lichamelijke waarneming die in het cognitief-gedragsmatige model genoemd wordt. De twee-punts discriminatie-drempel en subjectieve gevoeligheid voor onschuldige lichamelijke sensaties zijn gebruikt om mogelijke verschillen te kunnen objectiveren.
Hypochonderen blijken niet beter in staat om twee tactiele lichamelijke signalen te onderscheiden: hun twee-punts discriminatie-drempel is niet significant lager dan die van de controleproefpersonen. Het feit dat zij daarentegen, meer dan de controles, zeggen gevoelig te zijn voor goedaardige lichamelijke sensaties, benadrukt het belang van de cognitieve aspecten van de stoornis.

Hoofdstuk 6 is gericht op de overmatige aandacht op en rapportage van lichamelijke symptomen, die bij hypochonderen verondersteld wordt. Onderzocht is of de aankondiging van een lichamelijke prikkel voor de hypochonder op zich al voldoende is om lichamelijke sensaties op te merken en te rapporteren. Hiertoe werd een toediening van een ongevaarlijke electrische stroom aangekondigd maar niet daadwerkelijk uitgevoerd. Suggestibiliteit (beïnvloedbaarheid) is geobjectiveerd door het aantal keren dat de proefpersoon aangaf stroom te voelen en door de tijd die verstreek tussen de aankondiging en het voelen van de stroom. Verwacht werd dat hypochonderen gemakkelijker mee zouden gaan in de suggestie en dus vaker en sneller een stimulus zouden 'detecteren' dan niet-hypochonderen.
In tegenstelling tot deze verwachting blijken juist niet-hypochonderen vaker en sneller te reageren. Hypochonderen blijken zich dus minder gemakkelijk dan verondersteld te laten beïnvloeden door de suggestie.

Hoofdstuk 7 betreft een studie waarin de aandachtsvoorkeur voor negatieve informatie en het vrijwel negeren van positieve informatie - beide door het model gesuggereerd - bij hypochonderen tot uiting komen in het huidige kennisniveau ten aanzien van kanker.
Verondersteld werd dat, in vergelijking tot niet-hypochonderen, hypochonderen meer zouden weten over kanker in het algemeen en over de waarschuwingssignalen voor kanker in het bijzonder. Bovendien werd verwacht dat de hypochondere groep het vaker eens zou zijn met, en meer zou weten van bedreigende uitspraken omtrent kanker. Voor wat betreft geruststellende uitspraken werd in de hypochondere groep een lager kennisniveau verwacht en minder instemming. De belangrijkste bevinding is dat, alhoewel de groepen niet verschillen in algemene kennis over kanker, hypochonderen vaker een signaal ten onrechte beschouwen als een waarschuwingssignaal voor kanker en het vaker eens zijn met bedreigende uitspraken omtrent kanker.

Hoofdstuk 8 gaat eveneens in op de karakteristieke informatieverwerking door

hypochonderen, zoals die is weergegeven in het cognitief-gedragsmatige model. Onderzocht is of de kennis omtrent kanker toenam na het bekijken van een twintig minuten durende voorlichtingsfilm. Op grond van de theorie werd verwacht dat hypochondere personen relatief minder toename van kennis, meer toename in het instemmen met dreiging en in het afwijzen van geruststelling, en meer toename in het rapporteren van lichamelijke symptomen zouden laten zien. Hypochonderen en niet-hypochonderen blijken evenveel te leren van de informatie over kanker. Terwijl hypochondere personen het voor de videofilm vaker dan de controles eens zijn met bedreigende uitspraken, blijken de groepen na de film hierin niet langer te verschillen. Nadat ze de kankervideo bekeken hebben, zijn beide groepen meer geneigd om het oneens te zijn met geruststellende uitspraken. Bovendien rapporteren beide groepen na de film minder lichamelijke sensaties.

Hoofdstuk 9 beschrijft een studie naar de bij hypochonderen veronderstelde geneigdheid om de kans op negatieve gebeurtenissen te overschatten. Deze laatste studie inventariseert bij beide groepen de gevaarsinschatting van ambigue gebeurtenissen, die al dan niet betrekking hebben op de gezondheid. Uitgaande van de bij hypochonderen veronderstelde geneigdheid om positieve informatie te negeren en aan negatieve informatie veel aandacht te besteden, werd verwacht dat hypochondere patiënten sterker op dreigende berichten zouden reageren en minder op geruststellende berichten. Door proefpersonen een inschatting van het gevaar te laten maken, is de verwachte antwoordstijl geobjectiveerd.
Alhoewel hypochonderen ambigue gezondheids-ituaties duidelijk als gevaarlijker inschatten, blijken ze noch immuun voor geruststellende (veiligheids)informatie noch overmatig gevoelig voor bedreigende (gevaars)informatie te zijn.

In *Hoofdstuk 10* wordt een samenvatting gegeven van de belangrijkste bevindingen en worden opmerkelijke resultaten en hun gevolgen voor het model van hypochondrie nader besproken. Klinische en theoretische onderwerpen komen eveneens aan bod.
Geconcludeerd wordt dat bevestiging gevonden is voor het bestaan van een aandachtsfocus op het eigen lichaam en een toegenomen lichamelijke waarneming bij hypochonderen. Geen bevestiging is echter gevonden voor het verwachte negeren van positieve informatie en voor de veronderstelde aandachtsvoorkeur voor negatieve informatie.
Het onverwachte verschil in suggestibiliteit lijkt een specifiek outputfenomeen (d.w.z. rapportage uitgelokt door de instructie) uit te sluiten als een geschikte verklaring voor de hogere symptoomrapportage die bij hypochonderen gevonden wordt. Superieure waarnemingsvaardigheden - voortkomend uit het voortdurend letten op interne gewaarwordingen - en een wantrouwende houding ten aanzien van suggestie kunnen hierbij van doorslaggevend belang geweest zijn. Bovendien, ideeën omtrent gezondheid, lichamelijke symptomen en ziekte zijn waarschijnlijk van grote invloed op aandacht, waarneming, geheugen en inschatting. Hypochonderen blijven daarom sterk georiënteerd op hun interne ervaring en op hun persoonlijke interpretatie daarvan.
Met betrekking tot de kennis over kanker blijkt, dat ondanks hun sterke algemene

geneigdheid om bedreigende informatie op te zoeken, hypochonderen niet meer weten dan niet-hypochonderen. Bij het opsporen van waarschuwingssignalen blijken hypochonderen onschuldige lichamelijke sensaties of signalen ten onrechte als waarschuwingssignaal te interpreteren. Zij 'ruiken' niet alleen overal gevaar, zij lijken bovendien naar absolute zekerheid ten aanzien van hun gezondheid te verlangen. Met andere woorden, zij blijken weinig tolerant te zijn ten aanzien van gezondheidsgerelateerde ambiguïteit. Het feit dat men gezond kan zijn, en op hetzelfde moment eenvoudige, niet herleidbare lichamelijke sensaties kan ervaren, houdt de hypochonder gevangen in zijn angst en zijn overmatige aandacht. Bovendien, aangezien het onmogelijk is te bevestigen dat iemand gezond is - de afwezigheid van een specifieke ziekte is het enige dat een dokter kan aantonen - blijft de hypochonder ontevreden en bezorgd over zijn gezondheid.
In vergelijking met niet-hypochonderen geven hypochondere personen hogere gevaarsinschattingen als het gaat om ambigue gezondheidsgerelateerde informatie. Met andere woorden, ook hier blijkt dat hypochonderen zich onderscheiden van niet-hypochonderen door een lage tolerantie voor onzekerheid omtrent de gezondheid. Aanvullende bedreigende of geruststellende informatie heeft hetzelfde effect bij hypochonderen als bij niet-hypochondere individuen. Echter, de hogere gevaarsinschatting van hypochonderen bij het beoordelen van ambigue gezondheidssituaties heeft tot gevolg dat zij nog steeds ernstig bezorgd en angstig blijven ten aanzien van dergelijke situaties nadat geruststellende informatie gegeven is.

Artsen en therapeuten die een hypochondere patiënt informatie geven over aspecten van ernstige ziekten om zo de angst voor ziekte of de overtuiging ziek te zijn te verminderen, lijken een nogal dubieuze strategie te kiezen. In plaats van de aandacht te richten op de gevreesde ziekte, zou meer aandacht aan de gezondheid moeten worden besteed. De behandeling moet cognitief zijn, gericht op het corrigeren van basale ideeën en de patiënt helpend meer inzicht te krijgen in de wijze waarop aandacht de lichamelijke signalen versterkt. Het benadrukken van de onmogelijkheid om zekerheid te krijgen met betrekking tot de eigen gezondheid en het beter met onzekerheid leren omgaan, lijkt meer effectief te zijn. Tot slot, inzicht verwerven in de eindeloze vicieuze cirkel van zoeken naar argumenten voor en tegen ziekte, kan nieuwe aangrijpingspunten bieden voor hypochondrie-therapie.
Voor wat betreft de theoretische implicaties van onze resultaten, kan het repliceren van onze suggestibiliteitsstudie en het verder bestuderen van suggestibiliteit bij hypochonderen een interessante richting zijn. Als toekomstig onderzoek onze ideeën bevestigt, dan zou een verminderde gevoeligheid voor suggestie toegevoegd kunnen worden aan de cognitieve karakteristieken in het model van Warwick en Salkovskis.
Ten aanzien van de misinterpretatie van medische informatie die genoemd wordt in het model, is nauwelijks enig bewijs gevonden dat hypochondere patiënten verschillen van niet-hypochondere personen. Mogelijk zal toekomstig onderzoek eveneens niet in staat blijken te zijn de verwachte discrepantie tussen de aandacht voor dreiging en het negeren van geruststelling te objectiveren. In dat geval zal dit aspect van medische informatie bijgesteld of wellicht uit het model verwijderd

moeten worden.
Zonder enige twijfel wordt gezondheidsgerelateerde ambiguïteit door hypochonderen als negatiever ervaren dan door niet-hypochonderen. Echter, in tegenstelling tot het tweede DSM-IV criterium, blijken hypochondere patiënten op normale wijze te reageren op aanvullende geruststellende en bedreigende informatie.

Dankwoord

En ineens zitten ze erop, mijn aio-jaren. Al die tijd heb ik mij voortdurend gesteund geweten door familie, vrienden en collega's. Slechts enkelen daarvan kan ik hier noemen. Ook de proefpersonen waren essentieel voor mijn onderzoek; zonder hen had ik de studies niet kunnen uitvoeren.

Mijn begeleider en co-promotor Ton Schmidt dank ik voor de samenwerking in de afgelopen jaren. Hij nam steeds de tijd om zijn ideeën over hypochondrie met mij te delen en nieuwe plannen op te zetten. Kalm en kritisch, relativerend en met gevoel voor humor, is hij voor mij een ideale 'baas' gebleken.

Mijn promotor Marcel van den Hout dank ik voor zijn kritische blik, zijn aanstekelijk wetenschappelijk enthousiasme en de enorme vaart waarmee hij mijn teksten beoordeelde.

Een aantal collega's en studenten werkte intensief mee aan de opzet en uitvoering van de hypochondrie-studies. Met name wil ik hier noemen Sabine Kroeze, Mieke Schoenmakers, Peter de Jong, Susan Stevens, Leny Visser, Iris Nelissen en Gerry van Wunnik.

Door mijn kamer te delen met Sabine Janssen waren al die jaren achter de pc toch plezierig. Het was niet alleen vanwege die uitnodigende droppot dat veel collega's steeds weer onze kamer binnenliepen.

Helga Nauta bedank ik voor de gezellige treinreizen en de gesprekken over het combineren van aio-schap en VGt-opleiding.

Joop de Kort bedank ik voor de onophoudelijke stroom morele steun per e-mail.

Mijn paranifmen, Nicole en Danielle Haenen. Promoveren met mijn zussen als 'achterban' op het podium, dat moet wel goed gaan!

Tot slot Han Roffelsen, mijn dagelijkse rots in de branding, dank ik voor alles.

Curriculum vitae

Marie-Anne Haenen werd op 6 April 1962 in Heerlen geboren. Na het behalen van het Atheneum B diploma aan het Grotius College in Heerlen begon zij in 1982 aan de studie Sociale Gezondheidkunde in Maastricht. In augustus 1988 studeerde zij af, met als afstudeerrichtingen Geestelijke Gezondheidkunde en Gezondheidsvoorlichting en -Opvoeding. In aansluiting daarop was zij tot februari 1992 werkzaam als klinisch psycholoog / neuropsycholoog i.o. bij de vakgroep Neuropsychologie van de Universiteit Maastricht, met een detachering in het Psycho Medisch Streekcentrum Vijverdal. Vervolgens trad zij als toegevoegd onderzoeker in dienst bij de vakgroep Differentiële en Experimentele Psychologie van diezelfde universiteit, waar zij onderzoek verrichtte naar de psychische gezondheidstoestand van kinderen van verzetsdeelnemers.
Van december 1993 tot mei 1998 was zij als assistent in opleiding aangesteld bij de vakgroep Medische Psychologie van de Universiteit Maastricht, waar het in dit proefschrift beschreven onderzoek werd uitgevoerd. In 1997 behaalde zij het gewoon lidmaatschap van de Nederlandse Vereniging voor Gedragstherapie. Met ingang van mei j.l. heeft zij een tijdelijke aanstelling als universitair docent bij het departement Medische, Klinische en Experimentele Psychologie, waar zij naast het geven van onderwijs, onderzoek voorbereidt op het gebied van overspannenheid. Daarnaast is zij als gedragstherapeut verbonden aan de RIAGG Maastricht en het Academisch Ziekenhuis Maastricht.